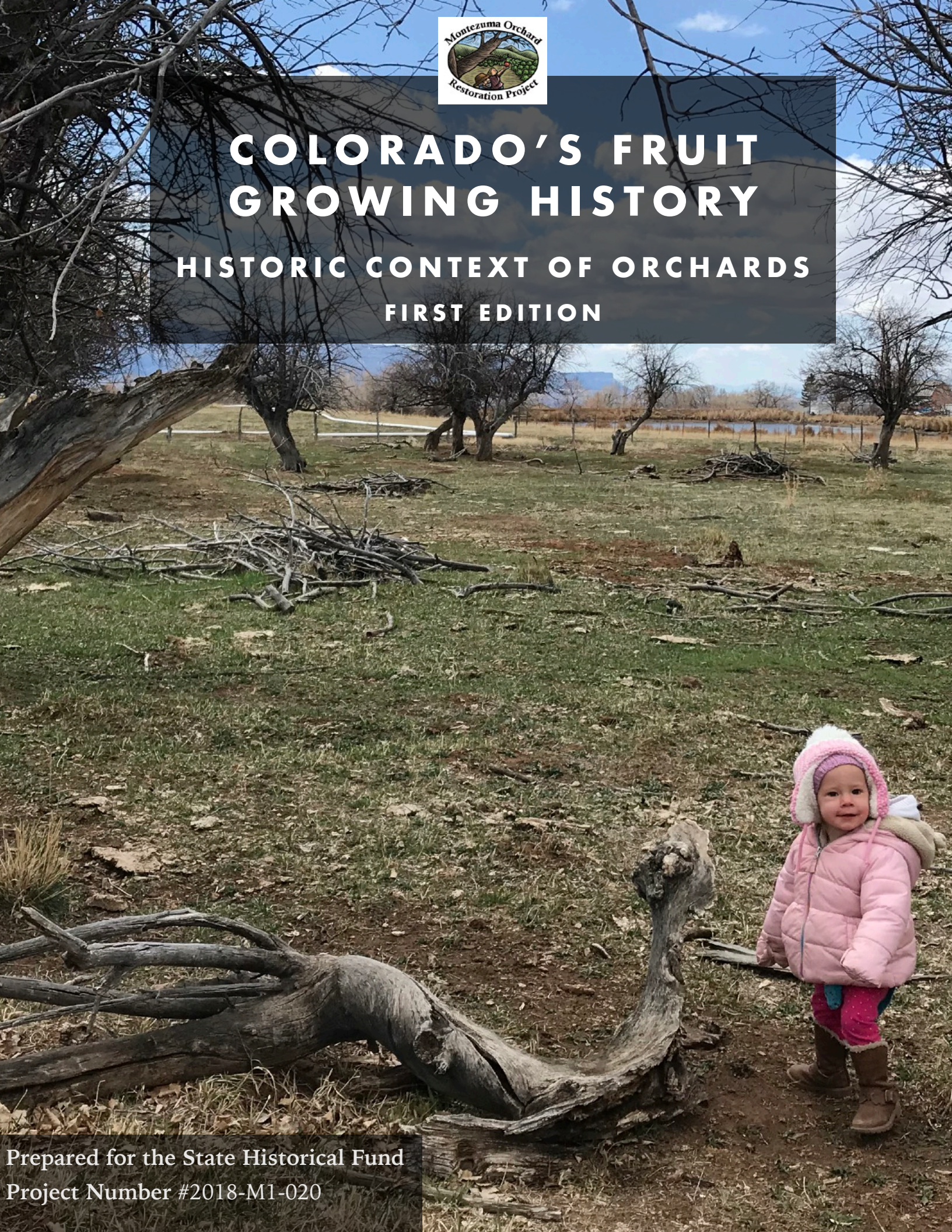

COLORADO'S FRUIT GROWING HISTORY

HISTORIC CONTEXT OF ORCHARDS

FIRST EDITION

Prepared for the State Historical Fund
Project Number #2018-M1-020

Front Cover: Historic Wayt orchard, Dolores, Colorado. Planted early 1900s. Contains rare and endangered apple genetic diversity. (Montezuma Orchard Restoration Project, 2019)

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Acknowledgements

The roots of this historic context began nearly two decades ago with our newfound awareness that a significant orchard history once existed in Colorado. It has since been the work of the Montezuma Orchard Restoration Project (MORP) to preserve Colorado's fruit growing heritage and restore an orchard culture and economy to the southwestern region. We are grateful to the staff at History Colorado for providing the opportunity to document this important, but nearly forgotten part of Colorado's past.

Throughout this project we have been honored to work with Dr. Ruth Lambert who's knowledge, guidance, and generous contribution of time were essential to the successful completion of giving context to this important epoch in Colorado's history.

Many thanks to Linda Meyer, Head Archivist at Colorado State University (CSU), and her helpful and organized staff who hauled countless boxes of CSU Extension, and other records, for our research, most of which had not been viewed since they were first archived. We will also be forever grateful to these archivists for accessioning the Miriam Palmer Wax Apple Collection that was re-discovered as part of this research.

Colorado museums, libraries, and historical societies were valuable contributors. A special thanks to Joyce Lawrence and June Head of the Montezuma County Historical Society, and to the staffs of the Western Museums of Colorado, Loveland Museum, Royal Gorge Museum, State Archives, and Denver Public Library. Online resources *Historical Photos of Fruita and Western Colorado* and *Colorado Historic Newspapers Collection* also contributed to this project with photos and historical context.

We are humbled by Colorado's early orchardists and their descendants who's persistence and imagination make all we do possible.

Jude and Addie, Montezuma Orchard Restoration Project

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INTRODUCTION

PURPOSE

Colorado's Fruit Growing History: Historic Context of Orchards tells the story of Colorado's historic orchards and orchard history including varieties of fruit grown, people that grew the orchards and orchard industry, and the locations of historic orchard districts in Colorado. The purpose of this context is to disseminate information about historically important orchards and fruit trees of Colorado, with a specific focus on apples and the formative history of Colorado's fruit-growing industry.

As part of this historic context, Montezuma Orchard Restoration Project gathered and analyzed existing data, conducted research trips to the Colorado State University archives, developed a database of Colorado apples and historic fruit growers, recorded three orchard sites, developed two educational classes, and created interpretive orchard signage at the historic Gold Medal Orchard.

This project will aid in the preservation of historic orchard landscapes by providing a context within which to evaluate the integrity and significance of historic orchards, and develop preservation treatment plans. This work is part of a History Colorado State Historical Fund grant intended to document our orchard history and teach classes about this substantial, but largely forgotten topic. Additional funding has been provided by Gates Family Foundation, Blue Canyon Cultural Consulting, and the Montezuma Orchard Restoration Project.

Dr. Susan Dolan's *Fruitful Legacy: A Historic Context of Orchards in the United States* provides a framework for this study and the development of the Colorado historic orchard context. Written for the National Park Service, Dolan's book is the definitive authority on orchard historical periods in the United States, and a primary reference to complement numerous first-hand accounts of Colorado's early fruit growers.

This context is the story of people and place, and the fruit that they grew. It is intended to serve as a guide and a tool. It should also remind us that Colorado can grow some of the highest quality fruit on earth, and that in preserving this past we can grow a sustainable future. However, before we move forward in remembering these parts of the past we are most proud of, it is essential that we remember and acknowledge those that we are not.

Most importantly, we cannot talk about our Anglo pioneering past without recognizing the devastating impact on Indigenous peoples. Before the Spanish came into southern Colorado,

and the Anglo Europeans crossed the plains, this land was inhabited by Native Americans for generations. Specifically, Montezuma Orchard Restoration Project acknowledges and apologizes for the fact that not all that long ago, Colorado's early fruit growers boasted about what we today clearly call genocide - in, for example, varying proud statements of, *"As aptly said by Dr. Shaw, the energetic fruit-growers of these valley's began planting fruit trees in the fresh tracks of the receding Utes"*.[1]

We must also consider the impact of our words as we write and tell this history. For example, while giving a class on Colorado's fruit growing history in early 2020, we made the point that without the apple, westward expansion would have been more difficult because the human body can not make its own vitamin C, necessary for life, which apples had in a readily transportable form.

After the class a reviewer criticized how racist that statement was realizing that Native peoples had been surviving here for thousands of years. The point is well taken. Native Americans had a cultural knowledge of sources of vitamin C from rose hips to berries - and adapted apples and peaches before Colonial times, passing their traditions of ecosystem harvesting across generations - a way of life that was uprooted with the genocide that was forced upon them through the process of western expansion. A cruel example, as western "pioneers" established new orchards, American armies in their destructive efforts to starve and displace Native peoples, slashed and burned Southwest Native American peach orchards, a crop adopted from Spanish conquistadors generations before.[2]

COLORADO IS OLD ORCHARD COUNTRY

Across Colorado the living history of a once thriving orchard culture and economy that began in the late 1800s remains scattered on homesteads, in cities and towns, on mesas, in canyons and valleys. Early day skeptics, those "doubting Jeremiahs" that said orchard fruit could not be grown in Colorado continue to be proven wrong by the perseverance of historic orchard trees.

Bundles of these trees, mostly apple, brought west in ox drawn wagons by early settlers populated our first orchards and provided the genetic material that would influence orchards for generations. A collaborative spirit emerged among the early growers allowing them to share their failures and success as they grew the orchard industry.

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[1] Colorado State Bureau of Horticulture, 1891/92, pp. 90, 96, 99, 104, 174

[2] Wytsalucy, 2019

Early fruit growers were told that orchards would not grow at Colorado's high elevations. Defying convention, they experimented aggressively planting cherries, pears, peaches, plums, apricots, and hundreds of varieties of apples at a time that now represents the height of North America's fruit diversity. They sought a premium on quality, employing techniques of their trade: breeding, grafting, harvesting, and marketing.

Rewarded for their efforts, by 1900, homestead and commercial orchards were well established across Colorado – from the Front Range foothills to the Arkansas Valley, across the mountains to the Grand Valley and into the remote Southwest – all regions winning premiums for their crops. Apples dominated Colorado's early orchards, but by the end of the 1920s the national trend had turned to the "shiny red apple" as orchardists were told to grow no more than three kinds. When fruit growing expanded from the Eastern Slope to the less harsh climate in the Western Slope, peaches eventually become the dominant orchard fruit.

As Colorado's population increased with the new 20th century, prime orchard land was lost to development, especially on the Front Range. Insect pressure, standardization, and the economy of scale from industrialization merged with consumer desire for shiny red apples to cause many of the old orchards and old varieties to disappear.

Yet, remnants of this early time of diversity remain in Colorado's landscape – primarily apples – growing in subdivision backyards, sections of hay fields, abandoned homesteads, and open spaces. The trees are hidden or right in plain site; sometimes forgotten, and other times revered by the families who always remembered.

HISTORY OF AMERICAN ORCHARDS

Early American Orchards:1600-1800

Orchard fruits, as they were known in the earliest days of early Euroamerican settlements of Massachusetts and Virginia and in the Spanish Empire to the south, were much as we know them today. Familiar fruit, such as apples and plums, peaches and cherries, were brought from across the ocean to their new home.

Initially the trees were planted from seed brought along on the voyage. Apples were the most adaptable, though peaches flourished in the south and southwest. The first orchards were characterized by tall trunks with branching beginning above the heads of grazing animals. They were irregularly spaced. Not all seeds grew into a tree, every tree did not live.

In the English colonies, apples provided fruit for cider, animal feed, and occasionally, if the seedling was of high enough quality, fresh fruit. When worthy varieties were discovered from the random variation in seedlings, cuttings were taken and new trees were grafted from the original tree. Grafting is the cloning of select varieties of fruits by the incision of the new wood of a chosen tree into a rootstock, or the upper portion of the tree top-worked[3] into an existing tree. Trees were cloned using this technique because apple trees will not grow true-to-type from seed.

The knowledge and skill of grafting is ancient. The Romans are known to have passed the knowledge of grafting and the spread of many varieties across their world. As Roman rule ebbed, the knowledge and the trees became cloistered in monasteries. Fruit cultivation emerged from the monasteries, into the walled gardens of medieval gentry, and into the fertile grounds of North America.

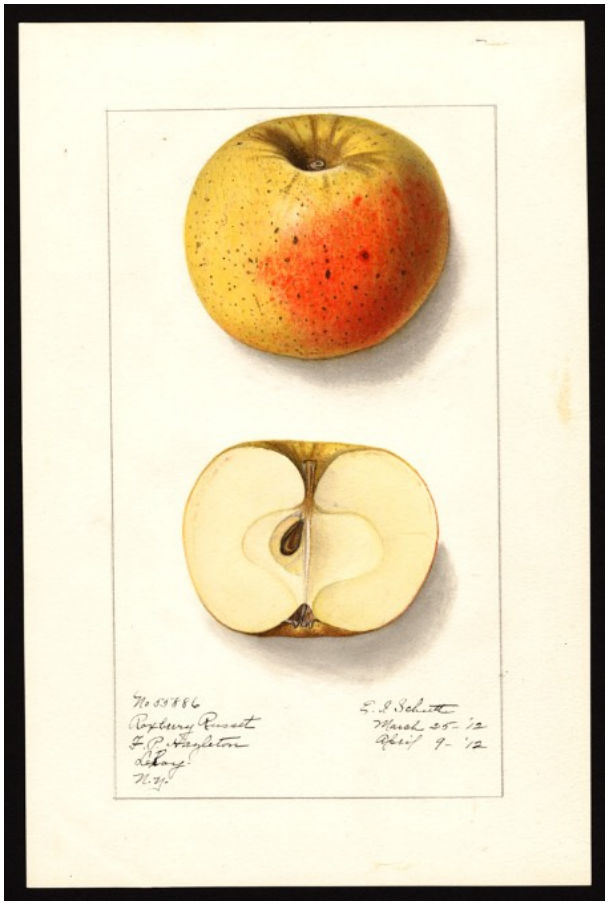

Figure 1: **Roxbury Russet** is considered the oldest apple variety which originated in North America. (U.S. Department of Agriculture Pomological Watercolor Collection)

By the mid 1600s, less than fifty years after the Pilgrims landed at Plymouth Rock, two American apple varieties would be of great renown. The Roxbury Russet of Boston and the Rhode Island Greening found such fame as to spread these varieties around New England, and eventually into early Colorado orchards more than two hundred years after their discoveries.

Throughout the 1700s, orchards planted by seed and occasionally top-worked to favored varieties, proliferated. Select American seedlings and European cultivars were grown together in the walled gardens of colonial aristocracy. The Hudson Valley's apple variety, the Esopus Spitzenburg and the French Calville Blanc d' Hiver, were grown by Thomas Jefferson in Monticello. As knowledge about cultivars increased, more orchards were planted, and orchards increased economic opportunities for early residents.

[3] See Glossary

Fruit Diversification and Migration: 1801-1880

When William Coxe wrote *A View of The Cultivation of Fruit Trees* in 1817, he listed 133 *"of the most estimable apples cultivated in our country."* W.H. Ragan published *The Nomenclature of the Apple* in 1904, listing more than 17,000 varieties of apples. These works help to demonstrate that the 19th century was known as the Golden Age of apples and orchard fruits in America due to early orchardists experimentation with fruit varieties.

Other orchard fruits experienced similar interests in varietal development, but the adaptability of apples over most of the United States made them more accessible. It also helped that apples are not true-to-type from seed, thereby helping to spawn new varieties. As with humans each offspring is a new creation.

County fairs, predating county extension offices, provided an important opportunity for growers to meet and discuss experiences. Originating in western Berkshire County Massachusetts, in 1804, county fairs were conceived as a means to promote the economic benefits of agriculture through friendly, local competition. These fairs allowed farmers to share knowledge, to compare apples to apples. As orchards in Colorado grew and prospered county fairs became the place for growers to share varieties and knowledge.

Most cultivars at this time were still grafted onto seedling rootstock producing full sized trees. Orchards became more consistent in their geometry as more trees were planted from grafts. Apples were often planted on a 25x25 foot grid with the ground between the tree rows used for hay, poultry, hogs, berries, or potatoes. Orchards, and the tree nurseries often associated with them, became commercial enterprises unto their own, not just a part of a farm.

During the 1800s seedling orchards increasingly produced a few choice varieties that were grafted into new trees. The knowledge of grafting, and the appreciation of new types of fruit grew from the founding of horticulture organizations and the publication of horticulture journals delivered by the U.S. Postal Service. Farmers became aware of orchard management principles, skills were developed, and more fruit of higher quality was produced.

Horticultural practices both old and new travelled westward with farmers including Native Americans. Euroamerican practices associated with propagating orchards can be summarized in the experiences of John Chapman and James Stark. During the early to mid 1800s, John Chapman, later in life known as Johnny Appleseed, collected apple seeds from cider mills in western Pennsylvania and took them by canoe into Ohio, and beyond, to establish seedling nurseries. Settlers purchased and planted the trees, in part, because orchards helped to meet

homestead requirements by showing a continuous use of the land. The seedling versus grafted apple trees of John Chapman were a throwback to horticultural practices of the previous century.

James Stark came into Missouri from Kentucky in 1816. In his saddlebags Stark carried the scion wood, the cuttings from trees, that would establish the first commercial nursery west of the Mississippi River. Many settlers purchased grafted trees from Stark Brothers Nurseries and Orchards as they traveled west. The seedling orchards, and all of their inherent randomness, were being replaced by grafted varieties with their clonal predictability to fit a market-driven lifestyle. James Stark was at the literal edge of this trend that impacted the establishment of western orchards.

This was the age of the Louisiana Purchase, the annexation of the entire southwestern United States, the tearing apart by Civil War, the creation of a continental empire through westward expansion of settlers into places that became the United States of America. The fruit stock moved with the people and it was adapted to and culturally modified as settlement expanded all the way to the Pacific, establishing orchards and myths of the frontier. Towards the end of the nineteenth century, a romanticized historic narrative developed as Americans became nostalgic about their agrarian and frontier past.

For example, the legend of Johnny Appleseed was created during this time. John Chapman has been placed in dominate culture by many historians, rather than as a man out of his time practicing a dying way of life. Within this frontier myth, *"his essentricies and projected kindness distracted Americans from the genocide and displacement of Indigenous populations that defined the country's expansion. Chapman's story championed white settlers and their journey into new, untouched land while ignoring the realities of displaced communities."*[4] This myth also helps support the dominate narrative that white settlers were the first persons to distribute New World fruits and establish orchards westward, whereas, Native Americans were the first to do so. Early on they adopted the apple, peach, and other fruits from English and Spanish colonists. In New England, the Pequot tribe cultivated apples and peaches. Throughout the Great Lake Region, even into Ohio, fruit trees were established decades before white settlers, including John Chapman, entered the region. In the Southwest, the first recorded sighting of peach trees adopted from Spanish missionaries by the Navajo and Pueblo tribes occurred in 1619.

[4] Pucci, Cavallo, 2021, p. 215

American armies destroyed the well established orchards of the Iroquois, Seneca, and Navajo (and likely others) as they “cleared new lands" for settlement.[5] [6]

Orchard Specialization and Industrialization: 1881-1945

In 1800, the majority of Americans were employed in agriculture, typically on family subsistence farms. By 1900, roughly one third of the nation’s population worked in agriculture. Farms, including orchards became larger, more specialized enterprises as other segments of the population went to work in other occupations.

In the 1880s, coinciding with the availability of low cost barb wire fencing, livestock began to be excluded from orchards. As this happened a new style of pruning emerged. This technique encouraged a more open branching form with fruit on lower, easier to pick branches. Many of our Colorado orchards were planted in this low-head, open-bowl style.

The increase of manufactured goods including fencing, sprayers, and cultivating equipment occurred not long after the founding of the U.S. Department of Agriculture (USDA) in 1862. The USDA began when about half of the nation's population were farmers and the county was engaged in civil war. The time was defined by cycles of feast or famine associated with small, family farms, and added pressure on the food chain to feed large standing armies, while simultaneously loosing much farm labor to both war and emancipation. The founding concepts of the USDA were to acquire and distribute agricultural advancements to the people by trialing and recommending new cultivars and techniques to America's farmers.

The Morrill Act was passed in 1862 by President Abraham Lincoln to distribute public land to support a system of land-grant universities. They were founded on the principles of teaching, research, and extension with a focus on agricultural and mechanical arts. Money raised by the states in selling the land was used to fund these institutions from start-up through to present-day. While acts and advancements in agriculture benefited settler farmers they came at a heavy cost to Native Americans. For example, *“Profiting from dispossession permeates Morrill Act grants. Colorado, for instance, located nearly half of Colorado State University’s grant on land taken from the Arapaho and Cheyenne less than a year after the Sand Creek Massacre of 1864, in which U.S. forces [Colorado militia] brutally murdered more than 200 members of those tribes*."[7]

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[5] Kerrigan, 2008, 2013

[6] Wytsalucy, 2019

[7] Lee, 2020

The 1914 Smith Lever Act developed a partnership between the USDA and land-grant universities to offer research and educational opportunities in agriculture by forming a cooperative extension service focused on rural communities. Extension agents were sent out across rural America, contributing to an agricultural revolution that resulted in increased productivity and less farmers producing more food.

Through observation and experimentation theories were proofed and standards were developed. These practices and recommendations were distributed through local cooperative extension bulletins and annual USDA yearbooks. For example, the 1916 yearbook contained artistic renderings of Rome Beauty apples at different stages of harvest, ripening, and storage as a way to illustrate the proper time to pick, and the best way to store fruit.

The greatest advancement in farming technology occurred when Henry Ford began mass producing light weight tractors for the American market in 1918. These tractors would forever change farms and farming because they could far outwork a person with a horse or mule drawn implement. Since the tractors used gasoline they did not need pasture or hay, essential with horses and mules, freeing more land for crop cultivation.

The height of home apple production in North America were years 1900 to 1910 when 200 million apple trees grew across the landscape.[8] Home production began to be replaced with a commercial fruit industry due to systematic approaches to growing made possible by new technologies. As fewer people farmed, and crops were shipped to more distant markets, the thousands of varieties of fruits grown at the time became a burden to sell. In America, retailers wanted a shiny red apple. Consumers shifted from harvesting fruit from their own farms and backyards to purchasing produce from store shelves.

During much of the 19th century, the Ben Davis apple variety became the main crop apple across most of the central and southern states. The Baldwin variety was more commonly grown in the north. In the 1870s, a chance seedling on the farm of Jesse Hiatt in Peru, Iowa, would change American orchards forever.

Originally called the Hawkeye, rights to the apple were bought by Stark Brothers Nursery and in 1895 they released it with the new name Delicious. Due to wide regional adaptability, early bearing, attractive appearance, and ability to mutate, the Delicious grew in popularity until nearly half of the apples commercially produced in America were a Red Delicious strain of some type. Over the next century, the number of apple varieties grown and eaten in North America would decline from roughly 16,000 varieties to 3,000, representing an 80% loss in

[8] Nabhan, 2009

diversity. Concurrently, independent nurseries were replaced by box store chains at a dramatic scale, further contributing to this loss of heritage varieties even in backyard orchards.[9]

Peaches, cherries, pears, and plums underwent a similar reduction of varieties, but many of the standard types, Bartlett pear, Elberta peach, Montmorency and Bing cherries remained. The orchards themselves were of comparable spacing to earlier orchards and these fruits were budded onto seedling rootstocks.

Fruit Monoculture and Orchard Intensification: 1946 - Present

Although the number of apple varieties grown in commercial orchards decreased during the late 1800s and early 20th century, up until about 1946, the trees remained large, grown on seedling rootstock, and widely spaced. Thirty by thirty foot grids were not uncommon. Sixty to seventy trees were planted per acre each producing about ten bushels or more per tree. Many remnants of these megalithic plantings remain in the rural counties of Colorado's historic orchard districts.

In Europe before the Second World War, experimental stations developed dwarfing rootstocks for orchard fruits. Dwarfing orchards allowed for dense plantings and the increased cost of 500 to 1000 trees per acre in these dwarfing orchards was justified because of the lack of agricultural land and increasing populations.

After WWII, as American suburbs expanded into productive farm ground, the need to put more trees per acre grew. In combination with agricultural colleges and extension agency outreach, growers became uniform producers of a commodity product. The high costs of spraying, pruning, fertilizing, and grading to meet market standards, combined with consumer insistence on blemish-free fruit, further doomed many of the three to five acre farm orchards.

As the farms were transformed into houses and strip malls, many of the rare fruit types still found in these orchards were torn out and lost. *"By 1950, there were fewer than 50 million apple trees left in the United States, less than a fourth of the number grown a half century earlier."*[10] Some trees remain as it was often easier to leave them in place than to remove them. They are forgotten genetic repositories that still adorn backyards, alleys, parking strips, and open spaces.

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[9] Nabhan, 2009

[10] Nabhan, 2009

The Red Delicious began to fall out of favor beginning in the 1980s through today as American consumers showed interest in new introductions, beginning with Granny Smith, Fuji, Gala - to the newest arrivals - Honey Crisp and Cosmic Crisp. Changing consumer tastes and fear of variety obsolescence has motivated the commercial development of new varieties, and paradoxically, the rediscovery of old ones. Threats to fruit culture in the 21st century continue to be from development pressure with added stresses caused by drought and climate change. However, with the renewed interest in local and heritage fruits, there is hope to reclaim much of the cultural knowledge and genetic diversity that were lost over the last 100 years.

This historic context is the story of people, places, and trees over time. In *A Fruitful Legacy: A Historic Context of Orchards in the United States,* Dr. Susan Dolan divides America's orchard history into several distinguishable periods of time based on orchard trends, with the national second period lasting from 1800-1880. Colorado's commercial orchard industry began with the Pikes Peak gold rush in 1859. As trends started sooner on the East Coast and took longer to spread and be adapted further west, our first period of orchard development in Colorado lasted until about 1920 when standardized theories of production began to dominate. This period of time ended post WWII when dwarfing trees became standard, and then followed national trends more closely. Based off of Dolan's work we divide Colorado's orchard history into three periods, pre-1920, 1921-1945, and 1946 to present. These periods are meant as guides and should not be seen as rigid and absolute. History in orchards is a continuum, not a moment - there are always exceptions to the rule - and our work today may be defining a new period in Colorado's orchard history.

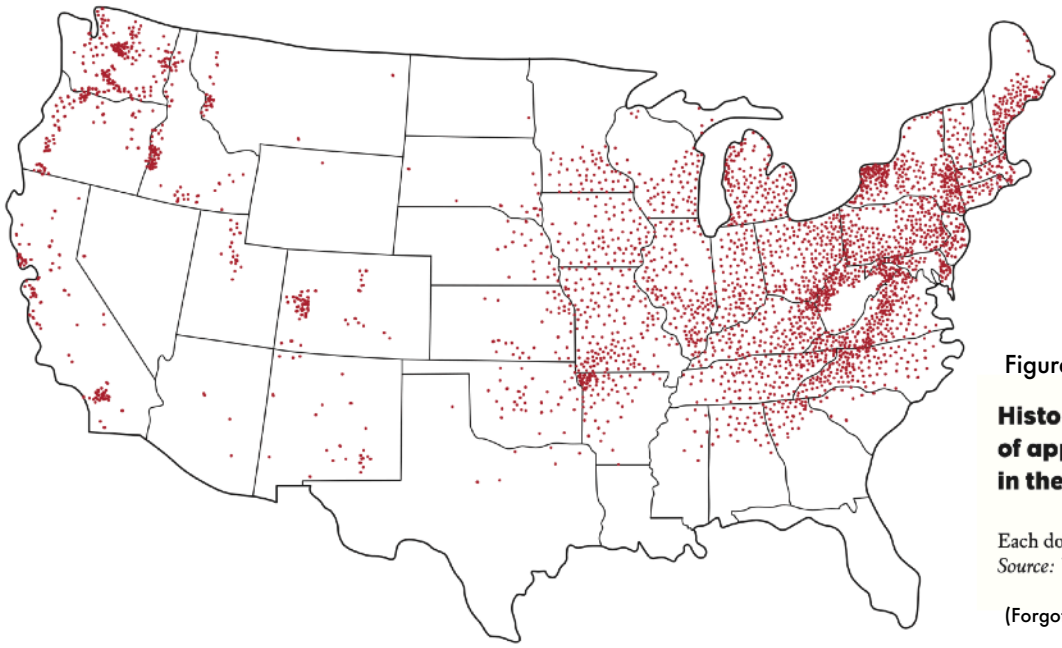

Figure 2:

Historic distribution of apple diversity in the United States

Each dot represents 25,000 trees.
Source: USDA Yearbook, 1927

(Forgotten Fruits Manual & Manifesto)

THE COLONIZATION OF COLORADO

Colorado was formed as a territory in 1861 in the wake of the 1859 Pike's Peak Gold Rush. White settlers flooded to the region, encroaching on the homeland of the Arapaho, Apache, Cheyenne, Shoshone, and Ute tribes. At the time, the Comanche, Kiowa, and Navajo still entered the region to hunt.[11]

During the Colorado War (1863-1865), American armies removed the Arapaho, Cheyenne, Comanche, and Kiowa from present-day Colorado to present-day Oklahoma. The war included the 1864 battle known as the Sand Creek Massacre where U.S. Army commander, John Chivington, ordered an attack on a peaceful Arapaho and Cheyenne village, brutally murdering hundreds of people, primarily women and children.[12]

When the Colorado Territory became a state in 1876, several bands of Utes were the last remaining Indigenous population in the region. Despite being the oldest continuous inhabitants of Colorado, by 1880, the southern Ute bands were pushed to a small strip of reservation in southwestern Colorado, and the northern Ute band was removed to a reservation in Utah.[13]

The taking of Ute land occurred through a series of broken treaties and agreements that began with the Treaty of Abiquiú (1849) and Treaty of 1868 and ended with the Brunot Agreement (1873) and 1880 Agreement. Included in these false promises of peace, land, annuities, and sovereignty was language forcing the tribes to assimilate into western culture.[14]

One method used was to separate native children from their parents through the institution of Indian boarding schools. In Colorado, remnants of the campuses of the Teller Indian School in Grand Junction (1886 - 1911)[15], Fort Lewis Indian School at Hesperus(1892 - 1911)[16], and

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[11] Encyclopedia Staff, last modified 2020

[12] Encyclopedia Staff, accessed on June 14, 2021

[13] Young, 1993

[14] Encyclopedia Staff, accessed on June 21, 2021

[15] Lofholm, 2018

[16] Boxer, 2020

Southern Ute Boarding School in Ignacio (1901 - 1920)[17] remain today. Evidenced in these sites is the emphasis that was placed on agriculture as a way to erase native heritage.

Figure 3: An emphasis on agriculture is evident in this circa 1910 photo of the campus of the Southern Ute Boarding School in Ignacio. (Southern Ute tribe)

William E. Pabor, founder of the town of Fruita, is remembered by historians for his achievements in fruit culture and as a nationally recognized poet. A closer look into the archives places him, and others, within the racist and genocidal context of western expansion. In 1886, at the annual meeting of the Northern Horticulture Society in Boulder, he presented what was described as "poetic thoughts", in an essay entitled *The Cottonwood Tree,* to the audience where it was "moved and carried that a vote of thanks be tendered for his excellent paper." In it, he compares the Arapaho and Ute tribes to the native cottonwood tree, describing both as weeds and savages. He celebrates civilization, progress, assimilation, and the "glory" of cultivated crops, including orchards.[18]

> *…And co-eval with the tree was the denizen of the valleys and foot-hills - the dusky-faced Arapahoes and Utes, whose tepees were set under the umbrageous trees, whose pappooses climbed with glee the lower branches of the forest growth. Each was course in its nature, and cruel; the one a gross robber of the soil [cottonwood], the other a savage robber of the game abounding in the land [Native Americans]*

[17] Simpson, 2020

[18] Colorado State Horticultural Society and Forestry Association, 1887 - 1888, pp. 548 - 554

> *… There are to be Indian schools to civilize the young of the savage man; this on the score of humanity; but there will be no forestral schools to preserve and perpetuate the savage tree [native cottonwood]. It is to pass away. A newer type, combining usefulness and beauty, has already begun its civilizing work in our State…It is no longer the cottonwood whose feathery bloom is upon the air…Here are the white blossoms of the apple; there, the pink blossoms of the peach; these come at each recurring season, and in them we read the promise, as from an open book, of the orchard lands of the future, in the sheltered valleys of the eastern and western slopes of the mighty hills above us. As surely as the new type of man has taken the place of the old, so surely are the trees of civilization - bearing fruit after their kind - replacing the tree of the savage; and by and by, by the side of the grain field will be found an orchard…*[19] (William E. Pabor)

Many attempts were made by the United States government to "civilize" tribes by turning them into farmers. The Dawes Act or General Allotment Act passed by Congress in 1887 sought to do just that by dividing reservations into private lots for tribal members.[20] In reality, the Dawes Act further stripped Native Americans of their sovereignty and culture, and provided a legal means to take away even more land for white settlement due to arbitrary terms attached to land ownership.[21]

The Dawes Act did not affect the southern Utes when it first passed because white Coloradans preferred complete removal of their remaining native neighbors. However, when final attempts at this failed, focus turned to allotments. In 1895, the passage of the Hunter Act applied the Dawes act to the Southern Ute Reservation, reducing its size by hundreds of thousands of acres as "surplus" land was sold off to non-natives in patch-work fashion.[22] At that time, division was created between tribal members when the Southern Utes accepted allotment and the Ute Mountain Utes rejected it, relocating to the base of Sleeping Ute Mountain. In 1906, 70,000 more acres were taken when Mesa Verde National Park was established.[23] In tandem with the taking of land was the taking of water. It took over a century for agreements to be made to partially honor the water rights of the Southern and Ute Mountain tribes.[24]

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[19] Colorado State Horticultural Society and Forestry Association, 1887 - 1888, pp. 548 - 554

[20] Seyfarth, Lambert, 2010, p.8

[21] Encyclopedia Staff, last modified March 29, 2021

[22] Seyfarth, Lambert, 2010, p.9

[23] Encyclopedia Staff, last modified March 29, 2021

[24] Young, 1993

Going back before Colorado became a territory, the first European explorations into the area were the Spanish searching for mineral wealth. In 1765, Riveria travelled into the San Juan Mountains and western Colorado, followed by Dominguez and Escalante in 1776. In 1787, the Spanish attempted their only settlement on the north bank of the Arkansas River, San Carlos. The settlement was plagued with problems and quickly failed.

Other explorations into Colorado took place in the early 1800s through the 1840s. Fur trappers, scientific expeditions, and reconnaissance surveys penetrated the mountains in search of furs and pelts, floral specimens, and passages to the west. According to the explorer John C. Fremont, the beginning of American agriculture in Colorado began in the 1840s along the Arkansas and Platte Rivers with cattle, poultry, hogs, corn, and vegetable gardens.[25]

With Mexican independence in 1821, a lucrative trade route was established between St. Louis, Missouri and New Mexico. St. Louis born Ceran St. Vrain made the journey to New Mexico in 1825 as an agent of a trading company from his home town. St. Vrain chose to stay in Taos to join and supply trapping parties. In 1830, St. Vrain and Charles Bent formed Bent, St. Vrain, and Company. A few years later, they moved the fur trade with them to their new post on the north side of the Arkansas River near present day La Junta.

Located in proximity to the bison herds and the Cheyenne and Arapaho that provided the hides, Bent's Fort was also closer to St. Louis and the port of New Orleans. Bent St. Vrain, and Company created a network of trading posts from their hub on the Arkansas River including the St. Vrain post on the South Platte River. It was at Bent's Fort that an Englishman from St. Louis, Alexander Barclay, would go to work in 1838 believing he would save up enough money for a respectable return to England after a year of two on the frontier.

To counter the growing threat to their northern territories from encroachment by the Americans, officials in Mexico granted large tracts of land to settlers. This included tracts that later would become part of Colorado. The Ute and Navajo people were understandably not supportive of these Hispano incursions. However, by 1851 the first permanent Hispano-European settlement, San Luis, was founded in the San Luis Valley - which was by that time on land seized by the U.S. in the Mexican American War. In 1852, it was the establishment of Fort Massachusetts - Colorado's first permanent fort - that forced the Utes to leave the area. *"The Indians were understood to have a more or less valid title, which it was assumed would be extinguished when Congress should get around to the task of enacting the necessary legislation."*[26]

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[25] Steinel, 1926, pp. 15-20

[26] Steinel, 1926, p. 38

Colorado was not yet its own territory when the Pike's Peak Gold Rush began in 1859. Claim Clubs were established at this time to validate and arbitrate the various land claims made by the flood of settlers to the region. After Colorado became a Territory in 1861, legislation was enacted to recognize these early claims as valid.[27] In 1862, Congress passed the Homestead Act. Signed by Lincoln, the legislation transferred large parts of the American west from Native peoples to mostly Anglo settlers by giving 40 acres to would be farmers for a small fee and a few requirements. This act was followed up by the Timber Culture Act in 1873 that allowed for an additional 160 acres if trees were planted on 40 acres, later reduced to 10 acres. Through its clarifying of land claims, and promises of new beginnings, the Homestead Act, along with its follow-up acts and amendments, opened the west for American settlement, including much of Colorado.[28]

Familiar trade routes across the prairies towards the mountains would later be used by prospectors headed for the Colorado gold fields in the 1850s and early 1860s. Though gold was found at the confluence of Ralston and Clear Creek in 1850, it was not until seven years later when a more significant strike was discovered in Little Dry Creek, in what is now Englewood, and the Pike's Peak Gold Rush began.

The lure of mineral wealth in the Colorado mountains was the catalyst for railroad construction. As early as the 1850s, surveys for western railroad routes had been undertaken, but it was not until 1867 that the first nine miles of track were laid, and 1869 when Colorado was connected to the transcontinental railroad.[29] While the railroad represented progress to Euro-American settlers, it represented the destruction of their way of life to Indigenous peoples, including Lakota, Cheyenne, and Arapahoe living on the plains, where they resisted the construction of the railroad for years. The Treaty of Fort Laramie of 1851 brought temporary peace until the Sand Creek Massacre.

> *In retaliation for Sand Creek, Cheyenne and Arapaho warriors raided livestock, pulled down telegraph wires, and killed white settlers and migrants. This kind of interracial violence continued until 1870, bracketing the years the transcontinental railroad was being built through the region. American reports of Indian violence fanned fears among railroad companies and travelers alike. Railroad executives demanded the U.S. military protect the railroad project, and the railroads carried American soldiers – fresh from fighting in the Civil War – into the heart of the plains. It was common for both soldiers and*

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[27] Steinel, 1926, p. 45

[28] Horn, accessed June 30, 2021

[29] Fraser, 1998

> *overland migrants to kill native people on sight, whether or not they were part of the fighting.*[30] (Wendy Rex-Atzet)

During the 1860s and 1870s, rail lines were laid east of the mountains between Cheyenne and Pueblo. In 1877, the railroad reached Fort Garland in the San Luis Valley. Between 1877 and 1881, track was installed from Alamosa reaching Durango in 1881. *"Also in 1882, the expulsion of the Ute from most of western Colorado enabled the Denver & Rio Grande Railroad to extend their line to Gunnison westward to Montrose, then northward through Delta and Grand Junction on its way to Salt Lake City, providing the railroad with a transcontinental connection"*.[31] Although the transportation of ore was the initial stimulus for railroad construction, other products moved by train including cattle, lumber, household goods, and fruit, stimulating agricultural settlement.

Figure 4: Denver and Rio Grande Railroad depot in Hotchkiss, 1913. (Steve and Denise Hight, https://www.facebook.com/HistoricalFruitaPhotos/

[30] Rex-Atzet, Wendy, accessed June 30, 2021, pp 8-9

[31] Horn, 2004, p. 33

HISTORY OF COLORADO FRUIT ORCHARDS PRE-1920

PERIOD ONE: FRUIT DIVERSIFICATION & MIGRATION

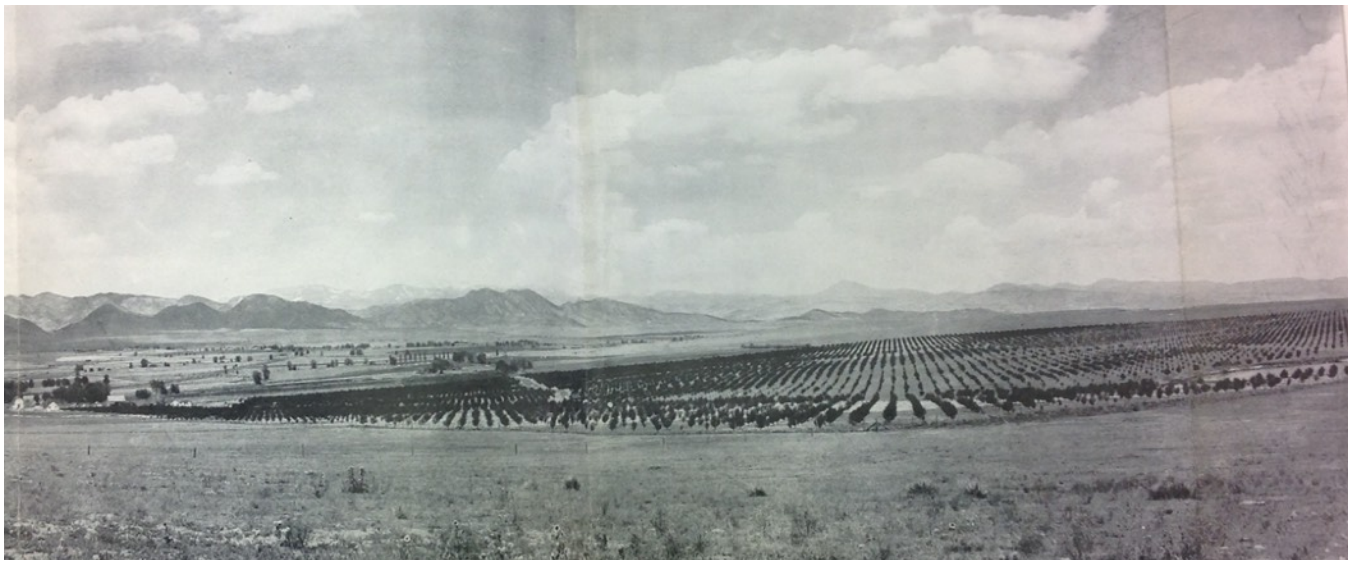

Figure 5: "Madison Orchard, 300 acres, (planted twelve years ago) Westminster, Colo., Eight miles from Denver. Owned by Charles B. Kountz, Denver, Colo."(Colorado State Board of Horticulture, 1908, inside cover)

EARLY GROWERS AND VARIETIES

Growers

The earliest record of fruit trees planted in Colorado is in 1846 by Alexander Barclay, clerk to Bent, St. Vrain, and Company. Barclay had trapped and traded, hauled goods to and from St Louis, and had been a resident and a participant of the early American migration westward. Barclay both kept a diary and was a consistent correspondent to his brother and sister back in England, leaving a record of his settlement and orchard planting in Colorado.

Barclay decided to turn to farming after the fur trade ended and when corn was in demand. The grass had been grazed down, the bison were wiped out, and the Natives were starving due to the destruction of their way of life.[32] An Indian agent reported in 1852, the tribes were "in abject want of food half the year…their children constantly crying out with hunger."[33] It was in the small community of Hardscrabble, located above the Arkansas River near present

[32] Lecompte, 1980, pp. 170, 171, 308

[33] Abbot, 2013, pp. 33-34

day Florence, where Barclay planted seed crops, peaches and cherries. The days of the trappers were passing and with the coming settlements there was a need and an opportunity for fresh vegetables, corn, beans, and fruit. In an April snow, 1846, Alexander Barclay planted his fruit trees.[34]

In the San Luis Valley, the early settlements of the 1850s established farm fields and built Colorado's first irrigation ditches known as acequias. Small family orchards were planted along streams and ditches.[35] Apple and plum varieties adapted to the region were brought to the area from Taos.[36] In 1891, Charles S. Crandall stated, *"In the San Luis Valley the small fruits are successfully cultivated, and in some places the hardier varieties of apple are doing well; but owing to the altitude, which is 7,500 feet, and to the short seasons, late spring frosts and cold nights, it is doubtful if any extended culture of tree fruits will be possible."*[37]

William Lee is credited with the earliest attempt at a commercial orchard in Colorado. Mr. Lee planted his trees along the banks of Clear Creek, in Golden, or along the banks of Spring Creek near Canon City, depending upon the account, between 1860-1862. A flood came down the canyon and washed Mr. Lee's trees away. He sought to find what he could, replanting the survivors on higher ground.[38] [39]

Along the Arkansas River, in what would become Florence, Jesse Frazer planted his orchard. There are many stories of Jesse Frazer coming to Colorado from the Illinois - Missouri borderlands, driving an ox-drawn wagon, bringing with him bundles of bare root fruit trees. The dates vary depending upon the source, but somewhere between 1862 and 1864, Frazer left a country immersed in the Civil War and headed west.

Frazer's claim to having both the first successful orchard and plant nursery in Colorado did not come instantly. He planted out thousands of fruit trees only to watch drought and grasshoppers kill most of them. Frazer persisted. By the time of his death in 1895, "Uncle Jesse" was considered to have the finest orchard in the state. Frazer's ability to graft, nurse, and sell fruit trees had a foundational impact on the varieties of fruit grown in Colorado.

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[34] Lecompte, 1980, p.171

[35] Simmons, 1999

[36] Valdez, 1991, p. 14

[37] Crandall, 1891, p. 21

[38] Colorado State Board of Horticulture, 1903, p. 101

[39] Steinel, 1926, p. 501

Frazer's willingness to share knowledge through his involvement in early state horticultural organizations and educational farm tours helped build the orchard economy along the Arkansas River, and across Colorado.

Imagination and persistence were two of the greatest influencing factors affecting the establishment of orchards, and the creation of an orchard economy in Colorado. Many people believed that fruit could not be successfully grown in Colorado. Drought, harsh winters, and grasshoppers consistently worked to reinforce this belief.

Colorado's earliest orchards were planted at a time that still represented the golden age of American pomology, known to fruit historians as the height of fruit diversity in North America. At the beginning of the 19th century most orchards were still planted from seed. Since each seed produces a unique apple, American orchards became full of variation with many favorite seedlings being named. This time coincided with the founding of horticultural societies and the publishing and delivery of horticultural journals. Farmers learned the skill of grafting from these journals which they used to reproduce their favorite apple varieties.

By the time Jesse Frazer planted his first orchard in Colorado, orchard growing in the United States had become an occupation in and of itself as farmers filled their orchards with choice cultivars of fruit. The combination of knowledge and genetics created an explosion of human ability and varietal diversity that has yet to be surpassed in this country.

Early fruit growers to Colorado were presented with harsh and unknown growing conditions, but benefited from the upwards of 17,000 apple varieties then available in the United States. Initially, nursery stock was transported as bare root trees by wagon trains from places including Missouri, Iowa, and even California. Many of the early orchard owners started associated nursery business from the tree stock that would influence Colorado growers for a generation.

Back east, the conversion to less diverse orchards began in the 1880s. This trend accelerated and became standard practice across the country with Stark Brothers releasing the highly adaptable and wildly popular Delicious apple in 1895. In Colorado the trend to top-work existing trees into new and standard varieties like the Delicious began in the early 1900s. However, many varieties were still planted in pre-1920 orchards resulting in much diversity.

Early fruit growers initially shared information on growers and varieties among themselves without the influence of the United States Department of Agriculture. William E. Pabor's 1883 *Fruit Culture in Colorado: A Manual of Information* was compiled from the private correspondence and the public comments of his fellow growers. The growers continued to

collaborate forming the State Bureau of Horticulture in the late 1880s, transitioning to the State Board of Horticulture in 1893, with offices in the State Capitol and a published, official, Annual Report. County Fairs and State and National Exhibitions were also a place where growers shared knowledge while promoting the products of their labor.

> *W. T. Bozmon [sic] of Cortez will tell you something of fruit growing and farming in Colorado, and especially in the Montezuma valley, the most favored district of Colorado. He would have you know that the Montezuma valley grew the largest apple ever exhibited, and which took the World's Fair gold medal at St. Louis Exposition; that Montezuma valley fruits took 811 gold and silver medals at the late expositions at Chicago, Omaha and St. Louis, and that these fruits established a record at the Colorado State Fair which has never been approached, much less equalled, when, from an exhibit of 104 plates, they were awarded 97 first premiums and 4 seconds, or 101 premiums from a possible 104 on display.*[40] (Martha A. Shute)

These early Colorado horticultural reports contain many discussions with the people that were creating an industry of varieties suited to different locations in the state and best practices for the would be fruit grower. They also describe the struggles growers faced to convince others that fruit growing was even possible in Colorado.

FREMONT COUNTY

A. S. TAYLOR, INSPECTOR FOR FREMONT COUNTY

Fremont County has 3,700 acres of bearing orchards and 5,000 acres of non-bearing orchards. During the year 1912 there were 250 acres of young orchards planted.

This county produced 325 cars of fruit last season, of which 300 were apples. The fancy apples sold for 90 cents, and the choice for 55 cents per box. The best producing varieties were the Ben Davis, Wine Sap, and Geniton. Peaches brought 85 cents per box, cherries $2.50 per crate, pears $1.75 per box, and plums 90 cents per crate. We produced twenty-five cars of small fruits. The strawberries sold for $1.75 per crate, the raspberries for $1.55, and the blackberries for $2.25.

The apple-tree leaf-roller did a great deal of damage in this section this season, although spraying was thoroughly done. No smudging or heating was done, owing to the favorable spring.

We have one canning factory in this county, the Round Crest Canning Company, located at Canon City, which produced thirty cars of canned fruit this season. Twenty-one cars of vinegar and cider were also manufactured. We have four fruit associations in this county, viz.: the Fremont County Fruit Growers' Association, the Royal Gorge Fruit Growers' Association, the Round Crest Fruit Company, and the Gibson Fruit and Produce Company; all of which are located at Canon City.

Present conditions of our orchards are fine, and we look for a bumper crop this year.

Figure 6: Excerpt from A.S. Taylor, Inspector for Fremont County. Beginning in 1891 through 1919, detailed horticulture reports tell the experience of Colorado's early fruit growers, often in their own words. (Colorado State Board of Horticulture Report, 1912, p. 100)

[40] Colorado State Board of Horticulture, 1908, p. 74

In the earliest days David S. Grimes was ridiculed on the streets of Denver for suggesting that fruit could be grown in Colorado, but the opportunity to make money with fruit was irresistible. In the fall of 1859, John Martin was able to sell his first inventory of apples at his fruit stand on Blake Street, in Denver, for $1.25 each.[41] These accounts of growers, varieties, recommendations, and experiences are numerous. A few more excerpts follow.

Henry Lee shipped in 15,000 nursery stock from Iowa in 1870, which he sold at his business in Denver. Among his customers were David Brothers and Wilson Perrin, both successful pioneering fruit growers. Perrin is also considered to have one of the earliest nurseries in Colorado.[42]

In 1872 or 1873, one evening James S. McClelland of Fort Collins came home late,

> *and while eating his supper said to Mrs. McClelland, 'I can buy some railroad bonds, receipts or certificates for about one half of their face value, and can turn them in as payment for land at their face value. I believe that I will buy a tract of land [on Fossil Creek] and plant it in orchard.' Of course, I had to report the latest to my fellow workmen, who made all manner of fun of the project. The next night, sure enough, Mr. McClelland said that he had made the deal. Then, of course, we did pronounce him crazy, to think of growing fruit in Colorado*.[43]

Colonel A.C. Fisk had an orchard on South Broadway, at what was "formerly known as the Red Barn", but then became Fisk's Broadway Gardens. The orchard had 3,000 apple trees, 1,500 plum trees, and 50 cherry trees. Elitch's Gardens in north Denver had fifteen acres of orchards.[44]

Along the Santa Fe Trail Captain Crowley planted orchards near Rocky Ford and found fame winning a Gold Medal at the 1904 St Louis World's Fair, as did others around the state, including Reverend Howard Antes in Montezuma County who quickly re-named his orchard the Gold Medal Orchard. Crowley's successful orchard was the beginning of extensive plantings around Rocky Ford and Manzanola.

Captain Rockafellow's Fruitmere orchard, on the site of the now defunct Holy Cross Abbey in Canon City, was one of the finest in the state. He obtained his nursery stock from Jesse

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[41] Steinel, 1926, p. 502

[42] Colorado State Board of Horticulture, 1903, pp. 102-103

[43] Colorado State Board of Horticulture, 1901, pp. 108-110

[44] Colorado State Board of Horticulture, 1893, p. 254

Figure 7: In the famous Rockafellow Orchard, Fruitmere, early 1900. Captain B.F. Rockafellow and daughter, Mrs W.T. Little. (Colorado Board of Horticulture Report)

Frazer. Rockafellow planted sixty named varieties of apples on over eighty acres of orchard ground.[45]

In Boulder County, Hygiene became the center of apple growing activity with George MacIntosh having about 2,500 trees, comprising thirty or forty varieties of apples. George Webster's orchard was along the St. Vrain River, his first trees coming by wagon from Iowa, and later shipped from California. On the southwest edge of Boulder, orchards were planted near and at Chautauqua.

George J. Spear founded Greeley Nurseries, which sold nursery stock that included fruit trees, across the west. Born in Braintree, Vermont, from a family that dated back to colonial Massachusetts, Spear was a great promoter of Colorado fruit growers through his involvement on the State Board of Horticulture. He was one of the few voices in his time that acknowledged the contribution of women to the orchard industry.

[45] Steinel, 1926, p. 502

Near Bellevue, Charles Pennock created a one man experimental station testing hundreds of varieties of fruit and making them available to growers. Pennock's multi-page, handwritten nursery list is one of the great treasures of Colorado's orchard past. Pennock's good friend, James McClelland had a hundred acres of orchards on the farm he purchased along Fossil Creek with discounted railroad bonds. He was constantly experimenting with varieties of fruits, mostly apples and plums; doing the hard work of learning what would prosper on Colorado's northern Front Range.[46]

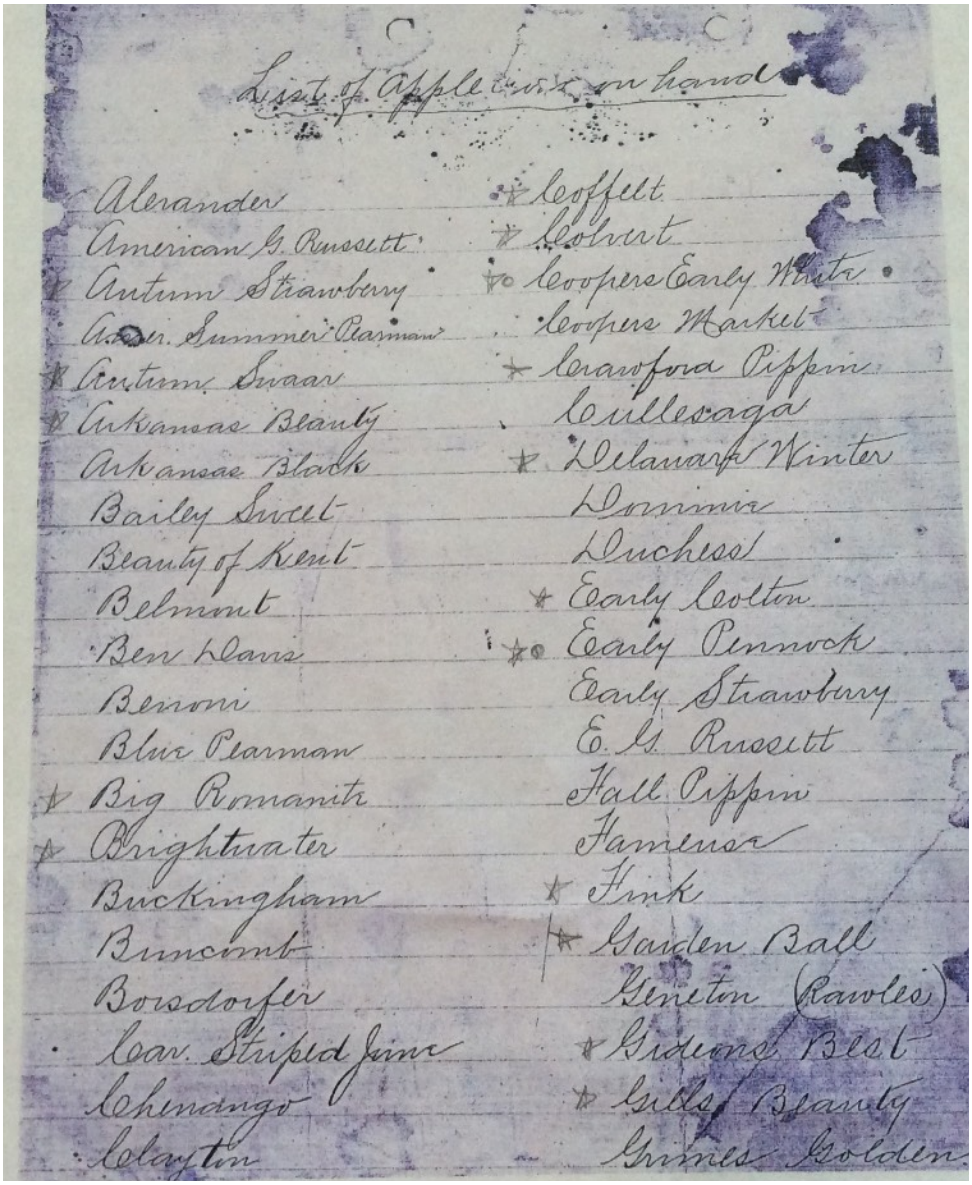

Figure 8: Charles Pennock's handwritten "List of Apples On Hand" from early 1900. This is the first page of the list that contains 122 varieties of apples, of which, 28 are considered lost or extinct today. (Scott Skogerboe)

[46] Steinel, 1926, p. 504

In Delta County, George B. McGranahan had a twenty acre orchard that included apples, peaches, pears, and seventeen varieties of plums. At Paonia, in a particularly sheltered location, the Hon. Samuel Wade had 65 acres in fruit comprising many of the same varieties as were in McGranahan's orchard. The horticulturalist W.S. Coburn had 40 acres of orchards at his ranch between Hotchkiss and Paonia.[47]

The first nursery in the Grand Valley was established by D. S. Grimes of Denver in 1881. Bob Orr ran the nursery for Grimes until Orr purchased the nursery. In about 1882, William Pabor laid out "Fruitvale" in five, ten, and twenty acre tracts. Planted in orchards and berries, the tracts were located around present-day Fruita, west of Grand Junction. In the following year, several orchards were planted north of Grand Junction with hardier varieties such as Snow, Red Astrachan, Walbridge, and Pewaukee apples being favored.[48]

The Grand Valley from Loma to Palisade was quickly covered with orchards. Besides Pabor in Fruita, Charles W. Steele and Elam Blain set out out apple and peach trees east of Grand Junction producing the first fruit grown in the area. William Baumgardner set out 84 different varieties of apples, plus peaches and cherries. At its peak in 1911, the fruit crop passed $1,000,000 in value thanks to the celerity of these early growers.[49]

Judge J. C. Bell had an orchard in Montrose along Spring Creek of 65 acres, and west of town the Ashenfelter orchards covered 320 acres.[50] Sometime about 1894, members of the Colorado Cooperative Company, a socialist utopian colony which today is the location of the town of Nucla, began digging an irrigation system and planting fruit trees in the remote west end of the county. On the western edge of San Miguel County, just east of Nucla, Mace Davis brought fruit trees from Missouri in a wagon, along with a piano, to his new home founded by the Coventry Townsite Company. His was the first piano to come up Norwood Hill in a wagon, and, all these years latter, his orchard still stands.[51]

Near Four Corners, deep in the heart of McElmo Canyon, transplants from East Tennessee, the Hall Brothers, Galloway Brothers, Duncans, and the Dobbins began spreading orchards across the canyon floor. Absalom Dillion would haul water in his wagon for many miles from

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[47] Colorado State Bureau of Horticulture, 1891-92, pg 255

[48] Steinel, 1926, pp. 505-506

[49] Steinel, 1926, pp. 505-506

[50] Steinel, 1926, p. 508

[51] MORP conversations with Jennifer Nelson of the Apple Core Project, 2021

the Dolores River to his orchard at Arriola high in the Montezuma Valley. In 1909, W.T. Bozmans's 55 acre McElmo Canyon orchard, originally planted by Jasper and Norman Hall, would yield 15,000 boxes of fruit.[52]

Growers including T. A. Kerr took advantage of the Durango & Silverton Railroad to ship their fruit up to Silverton and down to Durango from their orchards along Hermosa Creek in La Plata County. Evidence of ditches and orchards have been recorded along the San Juan River in SW Colorado, possibly with a Hispano influence.[53] [54]

Nearly all of the names previously mentioned were men, as men wrote much of the early history. Women were by necessity full partners in farming sharing the long hours and hard work. Many of their stories have been buried under their husband's names. But women growers were appreciated and many of the best pickers and packers were women. "*Some of the best and most successful fruit growers are women, and many widows have taken the farms with big mortgages and families, with the wolf standing at the door, and not only raised a family in a way that would be a credit to any man, but have also succeeded in raising the mortgage*."[55] (George J. Spear)

Figure 9: Palisade peach packers in the 1910s. (Photo by Frank Dean courtesy Marie Tipping Archives, Museum of the West, Museums of Western Colorado.)

[52] Colorado State Board of Horticulture, 1909 pp. 106-107

[53] Dittert, et. al., 1961

[54] Lambert, on-going research

[55] Colorado State Board of Horticulture, 1901, p. 112

IRRIGATING AN APPLE ORCHARD IN THE ANIMAS VALLEY, OWNED BY T. A. KERR, DURANGO, COLORADO.
Courtesy of the Denver & Rio Grande Railroad. Photograph by George L. Beam.

CULTIVATING ORCHARD OF W. T. BOZMAN, IN THE MONTEZUMA VALLEY.
Courtesy of Denver & Rio Grande Railroad. Photograph by George L. Beam, Denver.

Figures 10 & 11: (top) Irrigating an apple orchard in the Animas Valley, Durango CO. (bottom) Cultivating an orchard in McElmo Canyon, near Cortez CO. (Colorado Board of Horticulture Report, 1910)

Varieties

Varieties of apples now considered endangered or extinct such as Shackleford, Early Strawberry, Flora Bell and hundreds of others made their way into Colorado orchards. In some cases, we know who brought the varieties with them, and from where. Jasper Hall, known as the Fruit Wizard of Montezuma County, introduced the Thunderbolt apple into the state, possibly following his return from Fall Branch, Tennessee, where he was married in January, 1894.

Reports detailing discussions with early fruit growers provide the most information on tracing how and why certain varieties of apples arrived in Colorado. By 1883, Missouri Pippin was selected for its early productivity. Walbridge, Snow, Yellow Transparent, and Duchess of Oldenburg and many others were considered 'iron clads' being exceptionally cold hardy. Arkansas Black, Black Ben, Fallawater and Willow Twig were among varieties that came from Appalachia where they were popular selections at the time.

The Mountain Sweet and Colorado Sunset, the St.Vrain and Spencer's Seedless were new apples from Colorado as was the Colorado Orange apple. Originally a seedling rootstock with a graft that had failed in Jesse Frazer's orchard, the Colorado Orange would go on to be featured in Stark Brothers catalogs and used in the University of Minnesota breeding program. Orange in color, well flavored, and a long keeper this became the most popular apple of Colorado origin.

Figure 12 & 13: (left) Thunderbolt apple grown by J. D. Hall of Montezuma County, 1910, (right) Colorado Orange apple grown by A. N. Orndorf of Canon City, 1905. Both drawings submitted to USDA by Martha Shute and painted by USDA artist Amanda. A . Newton (USDA Pomological Watercolor Collection)

Nearly 500 varieties of apples were planted in Colorado[56], mostly during this early period of orchard activity. Apples were grown primarily for the fresh market where a premium was paid for fruit free of blemishes and defects, known as fancy fruit, as defined by the USDA grading standards. Often apples were planted by season of ripening; 20% of an orchard would be summer apples, 40% would be fall apples, and 40% of the trees would bear winter apples, keepers that would last until spring.

Before the Western Slope was open for settlement and fruit growing, peaches were a rarity along the Front Range. Old Mixon and Late Crawford peaches were successfully grown, but extra care was needed to protect the trees from the scouring winds. James McClelland stated that his cost of production was $5 per peach.[57] Pears, plums, and tart cherries were far more adaptable. Bartlett, Seckel, and D' Anjou pears were as common then as they are today. Montmorency, Early Richmond, and Morello cherries found ready markets both along the Front Range, and in processing facilities in Kansas City and Chicago.

A long harvest period was essential for the commercial viability of an orchard before refrigeration was available. Growers had crops from mid-summer until late winter. Labor was divided over months of picking so that smaller crews such as a family, or an individual could successfully harvest many trees over time. Homestead orchards were planted in similar fashion allowing a family to be able to harvest, process, and store fruit for many months.

Packing sheds and root cellars are commonplace to find on historic orchard sites. In addition to extending home use of fruit through the winter months, the ability to hold and store fruit aided in extending the harvest and marketing window, preventing having to sell at low prices during a glut crop season. Cold storage was also used to preserve the quality of fruit for shipping to faraway markets or to enter into fruit exhibitions.

There are several examples Montezuma Orchard Restoration Project has documented in Montezuma County. At the historic Hall/Olson orchard site there is a stone stacked root cellar built under a kitchen building. A historic barn remains with its north end dug into the slope and walls constructed of large sandstone blocks. This section of the barn was used as a cold room - first for apples, then potatoes when large sections of orchards were pushed out.

Located at the historic Neal orchard site, there were two 5,000 bushel root cellars connected by horse drawn rail lines and a turnstile. The packing shed was attached to another building, but open on a couple of sides to allow easy access for apples coming from the field, and with

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[56] See appendix "List of Old Colorado Apples"

[57] Colorado State Board of Horticulture, 1893-94, p. 201

tracks in the back going to the root cellars. The packing shed and one cellar with rail and turnstile remain today.

Towards the end of this period, large storage space became essential as orchards became bigger and were planted with fewer varieties of primarily fall-ripening apples that ripened all at once. Packing sheds were constructed to sort out, or cull, any wormy, bruised, or otherwise damaged fruit, and to separate apples into graded sizes.

Workers, usually women, would work sorting lines discarding poor quality apples and grading for size before packing them in boxes for shipping and storage. Remnant on historic orchard sites, it is common to find, barns, cellars, and sheds stacked high with old wooden fruit boxes and three-legged picking ladders developed specifically for harvesting. The picking basket with its shoulder straps, metal hoop, and empty-from-the-bottom flap design was invented and patented by George W. Bowman in Palisade in the early 1900s, and is still used today.

Figure 14: This root cellar located in the Montezuma Valley at the historic Neal orchard once stored up to 5,000 bushels of apples. Horse drawn rail lines were used to connect the cellar to the packing shed. (Tom Carr, 2015)

Figure 15: Picking, sorting, and building fruit boxes at McElmo Canyon, Colorado. Fruit labels say Montezuma Valley Fruits. (David L. Walton, Family Collection)

Figure 16: A group of apple pickers using the fruit-picking sacks invented by George W. Bowman of Palisade and patented by him in 1900. (David L. Walton, Family Collection)

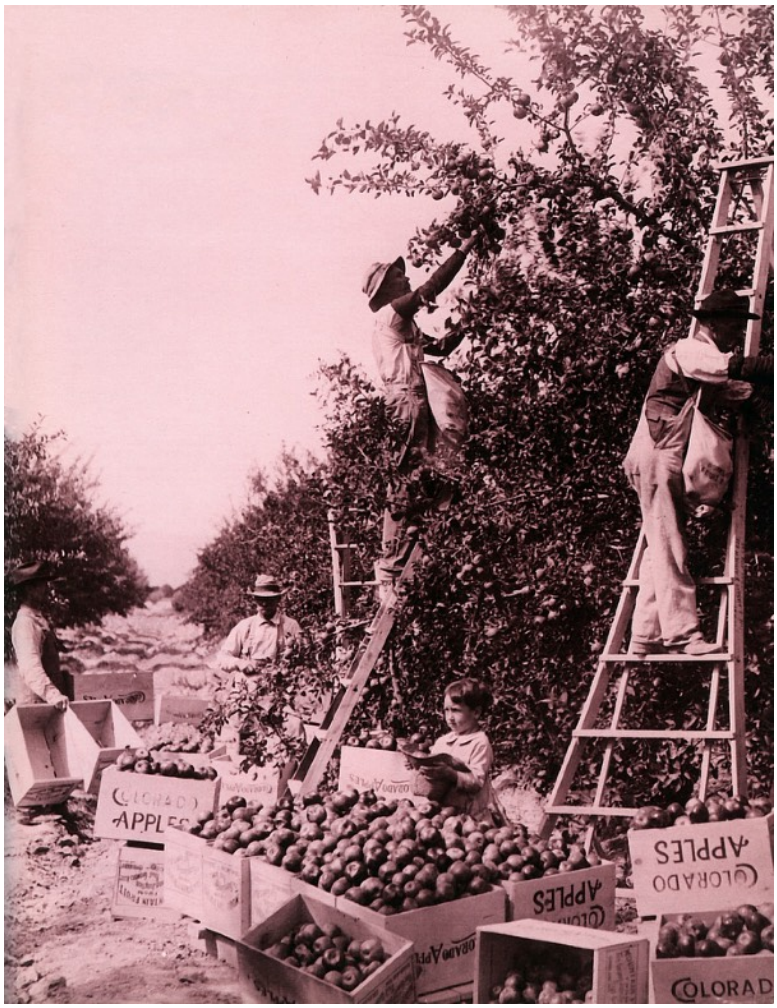


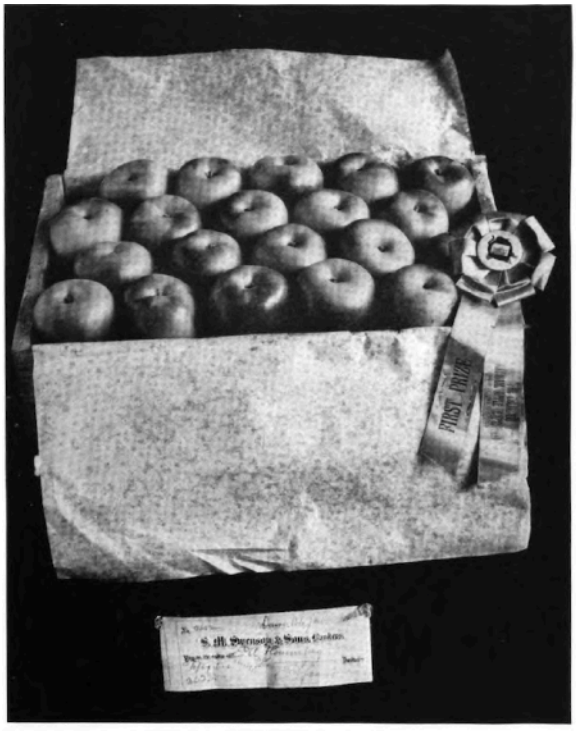
Figure 17: Grand Junction area apple pickers. Circa 1900–1910. Note the picking bags and ladders, and the fruit crates that state, "Colorado Apples and Mountain Fruit from Grand Junction Fruit Growers Association". (History Colorado)

Figure 18: Fruit crates stacked in a barn at the historic Runck/Roundtree orchard in Montezuma County. (Montezuma Orchard Restoration Project, 2014)

Figure 19: Three legged picking ladders at the historic Neal orchard in Montezuma County. (Tom Carr, 2015)

Colorado's fruit industry sprang from the humble beginnings of planting only crabapples (because surely they alone could survive), however by the late 1800s Colorado was a respected fruit growing state. Similar to Washington State in production, Colorado was still a minor producer when compared to leaders like New York. What set Colorado apart was the fruit quality.

In and out of the state, Colorado apples wowed consumers. The abundance of sunshine produced fruit of exceptional color, the cool nights set the sugars and acidity with explosive content of flavor. Many times common varieties were not recognized due to their handsome appearance free from the afflictions of humid climates. As a result, the common Ben Davis was renamed the Colorado Beauty. *It is generally conceded by all who have had an opportunity to inspect and to sample our Colorado product, that it excels in brilliancy of coloring, beauty and flavor, and that the Eastern or California product can not compare with it. At our various state horticultural fairs many Eastern as well as our own people were surprised at the beauty and size of our apples…*[58] (W.A. Eckerty)



PRIZE BOX OF WINTER BANANA APPLES, sold for $52.50 and forwarded to President Taft. The apples were exhibited at the National Apple Show, Denver, and grown by E. A. Fleming, owner of the Gold Medal Orchard, Silt, Garfield county, Colorado.

Mile High Photo Co.

Colorado has a wide growing reputation. Every fruit stand, from San Diego to Boston, places a Colorado label on their best fruit and charges a double price. A box of Colorado apples retails in the East at the price a barrel of ordinary Eastern apples sells for…To the sun-drenched orchards of these semi- arid lands, the world will look for the perfect apple…Climate, altitude, soil, irrigation, sunshine are all ingredients that help make perfect fruit. The apple tree is soon to be a greater asset than our mines.[59] (Hon. Alva Adams)

Figure 20: Prize box of Winter Banana apples. (Colorado Board of Horticulture Report, 1909.)

[58] Colorado State Board of Horticulture, 1897, p. 101

[59] Colorado State Board of Horticulture, 1910, p. 153

ORCHARD DISTRICTS & CHARACTERISTICS OF ORCHARDS

Orchard or fruit districts are general or specific areas where quality fruit grows well. They were commonly established across the United States. For example, the three principle apple districts in New York State were described by the Cornell Education Department in 1917 as the Ontario Shore District, Central Lakes District, and Hudson Valley District.[60] Noted for his seven volume set, *The Illustrated History of Apples in the United States and Canada*, apple historian Daniel Bussey says that dividing states into orchard districts was a wide spread practice, noting that even in states like Iowa, with slight geographical differences, there were wide temperature deviations depending on wether you were on the Minnesota-Dakota border or in the south near Missouri.[61] Orchard districts were often broken down into ever smaller districts using features like mesas and valleys, or school districts, to define boundaries.

Initially, Colorado orchards were limited to the eastern base of the mountains, or the Front Range, and along the Arkansas and Platte rivers that bifurcate the Eastern Plains. Later they extended to the western slope and southwestern corner of Colorado. These first orchard districts were divided into wide geographical areas defined as Northern, Southern, and Western.[62] The Colorado Bureau - later Board - of Horticulture reports, initially included all counties in these geographical districts, irrespective of each counties' ability to grow fruit. Overtime, the districts were refined to include the counties where fruit was actually grown. During detailed orchard surveys conducted years 1917-22, the orchard districts were further demarcated into the Northeastern District, Southeastern District, Western District, and Southwestern District.[63]

From the Wyoming state line down to what is now the southern suburbs of Denver became known as the Northeastern District. El Paso County, Fremont County, Pueblo and Otero Counties became the heart of the Southeastern District. As the Utes were forcibly consolidated into reservation lands in southwestern Colorado and removed from the Western Slope in the 1880s, the Western District was recognized as was the Southwestern District in the distant Four Corners region.

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[60] New York State Archives, accessed June 28, 2021

[61] In conversation with Daniel J. Bussey, 2001

[62] Crandall, 1891, p. 5

[63] Sandsten, et al, 1917-22

Along the Front Range, most orchards were placed near the foothills where natural features blocked the wind, rivers and creeks provided irrigation, and lucrative markets existed in growing cities and towns, in mountains, and on plains.

Colorado's early orchardists quickly learned how destructive hot summers and cold, dry winters were to the health of their trees. At a time when 'water follows the plow' was a popular assumption west of the 100th meridian, orchard owners realized the need to water deeply, early, and late in the season.

Orchards at this time were generally a part of a farm rather than enterprises unto themselves. Twelve to twenty trees would be common for a homestead orchard. Commercial orchards were normally at least one acre, but could be up to forty-five or fifty acres. At 70 trees per acre, with each tree producing ten bushels per tree at maturity, a ten acre orchard could be expected to yield 7,000 bushels, or 280,000 pounds of fruit.

Apple cultivars were grafted on to seedling rootstocks producing large, vigorous trees, typically spaced on a 25x25 foot grid. Occasionally orchards were planted in offsetting rows, like stars on the American flag.

DEVELOPMENTS & INNOVATIONS AFFECTING FRUIT INDUSTRY

Irrigation

Colorado's earliest farmers, the ancestral Puebloan of the southwestern part of Colorado, constructed reservoirs and farmed on terraces managing natural water flows for their benefit. Hispano settlers in the San Luis Valley constructed "people's canals". Irrigation ditches were used in the early settlements along the Platte and Arkansas rivers, but our concept of Colorado water law originated with the miners who had been in the California Gold Rush a decade before the Pike's stampede. Before hard rock mining was developed in the 1870s, most mining was done by running water over aggregate, and hopefully finding gold in the wash.

As in California ten years earlier, so too in Colorado, whomever used a creek first had first right to the water. This became codified in the Colorado Constitution under the concept of the right of prior appropriation. However, the Constitution recognized earlier water rights such as the San Luis People's Ditch, the oldest continuously operating ditch in Colorado and is Water Right No. 1 in the state, with a priority date of April 10, 1852.[64]

[64] Holleran, 2005

Development companies began building ditches and selling subdivided, irrigated land to settlers arriving by train from the east. *"Every year sees fresh irrigating canals constructed and a larger area of land made available for fruit culture".* [65] (Alexander Shaw)

> *A Chicago firm, believing that Colorado offers the greatest advantages of any western State to the farmer and fruit grower, have invested heavily in Colorado lands. They have expended about half a million dollars in reservoirs and ditches in El Paso County. Some 2,000 acres of fine land is now being sold in from ten to forty acres for the growing of orchard and farm products. This is only one of the many instances where eastern capital, after investigating many western locations, have decided that Colorado offers the best…The greatest development in this direction has been accomplished in the year just closing, where the Beaver Land and Irrigation Company are bringing under water 5,000 acres of as fine fruit land as ever lay outdoors, which is situated ten miles east of Canon City, five miles northeast of Florence and two miles north of Portland, on the Denver & Rio Grande. One thousand acres of apple trees were planted in this park last spring and 90 per cent of those trees show a growth of from eighteen inches to three feet. Two thousand additional acres will be planted this coming spring.*[66] *(Martha A. Shute)*

Real estate ventures became ditch companies managing complexed water delivery systems. For a time, orchards were great benefactors of irrigation infrastructure along the Front Range, and remain so on the Western Slope. Some, like the Union Colony in Greeley, and the Colorado Cooperative Company in Nucla, were founded on utopian principles and cooperative spirit.[67] More common were organizations like the Montezuma Valley Water Supply Company, grandparent of the current Montezuma Valley Irrigation Company, that viewed irrigation and development as inseparable. In 1885, the company hired engineers to layout the irrigation canals along with the proposed City of Cortez.[68]

Industry and Transportation

The 1870s brought changes to the fruit industry with advancements in technology, shifts in growing centers, expansion of transportation networks, and beginnings of productivity efficiency. The arrival of the railroad from Cheyenne in June of 1870 connected not only Denver to Cheyenne on the Denver Pacific Railway, but Colorado to the world via the transcontinental railroad passing through Cheyenne, which had been completed the year

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[65] Colorado Bureau of Horticulture, 1891-92, p. 17

[66] Colorado Department of Horticulture, 1908, p. 74

[67] Noel, 2013

[68] Freeman, 1958, p. 96

Irrigation in the Fruit Districts—Steel Flume to Convey Water to the High Mesa Lands, Paonia, Colorado.

Figure 21: Steel irrigation flume, Paonia (Colorado Board of Horticulture Report, 1912)

before in 1869. The development of rail lines to the south and west, coupled with advancements in hard rock mining in the mountains drew migrants to Colorado in the 1870s, creating substantial economic opportunities. Fruit growers passing through the experimental period were set to find gain in these new markets.

Canneries were established across all of Colorado's fruit growing districts to turn surplus crops that would otherwise go to waste into a value added product. Some were small scale operations as represented by the Mayer & Brigham Cannery, located on Jasper Hall's original fruit ranch in McElmo canyon with fruit provided by Hall and William Giles. Former commissioner Giles was the founder of the orchard that would soon gain fame as the Gold Medal Orchard, which was a few miles east of the Hall brothers fruit ranch. Jasper Hall became known as the "Fruit Wizard" of Montezuma County.[69]

There were also large enterprises such as Loma Canning and Preserving Company which was located in the west Grand Valley and the Empson's Canning Factory in Loveland. Situated near the rail line, trains brought fruit in to the canneries via local service then exported

[69] Montezuma Journal, September 4, 1897

canned goods to wider markets in and out of state. Canneries were especially important to the pie or tart cherry industries on the Front Range and in Fremont County. The market for pie cherries, was as a canned product. By 1914 there were 9 canneries in the Canon City region, including one owned by orchardist B.F. Rockafellow.[70]

Figure 22: Loma Canning and Preserving Company, circa 1920. After the Grand Valley Irrigation Project's completion, the U.S. Bureau of Agricultural Economics sent members of its photographic section to the Grand Valley to record the progress of agriculture there. (Steve and Denise Hight https://www.facebook.com/HistoricalFruitaPhotos/)

Colorado's railroad moved people and fruit. Potential growers arrived by train and often settled in areas serviced by the railroad. New growers arrived by train and boxcar loads of apples were transported out. Transport by rail allowed industrial goods and knowledge into the state just as it shipped fruit out. In addition to the freight line, electric interurban systems were built. An interurban railway was established in 1910 that ran from Fruita to Grand Junction, transporting people to and from the "big city." Service lasted until 1928 when the popularity of the automobile discontinued its use. Part of this rail system was known as the Fruit Belt Route for the purpose of transporting crops to the freight line for export out of region. Freight service ended in 1935 in favor of trucking, and the rails where pulled up.[71]

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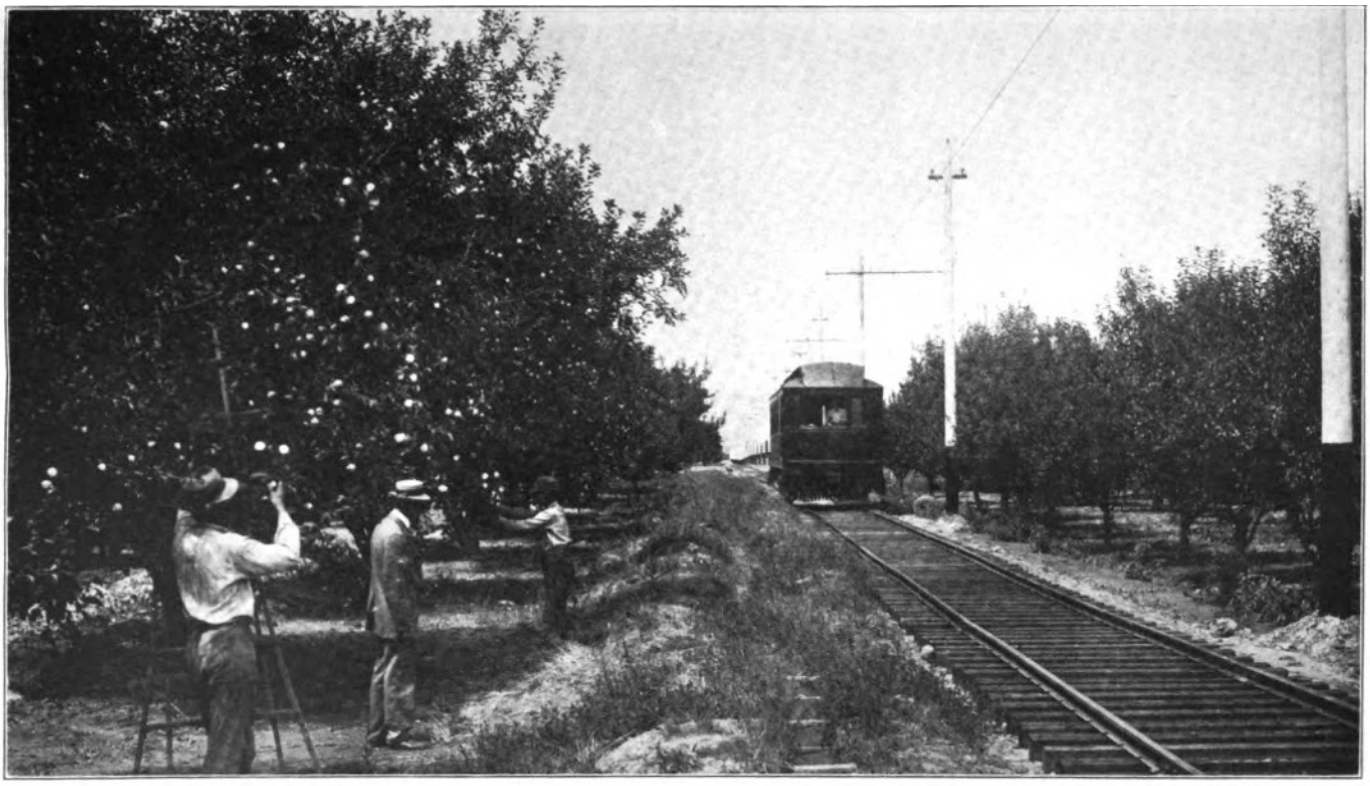
[70] Colorado College History Department, accessed 2021

[71] Hight, 2018



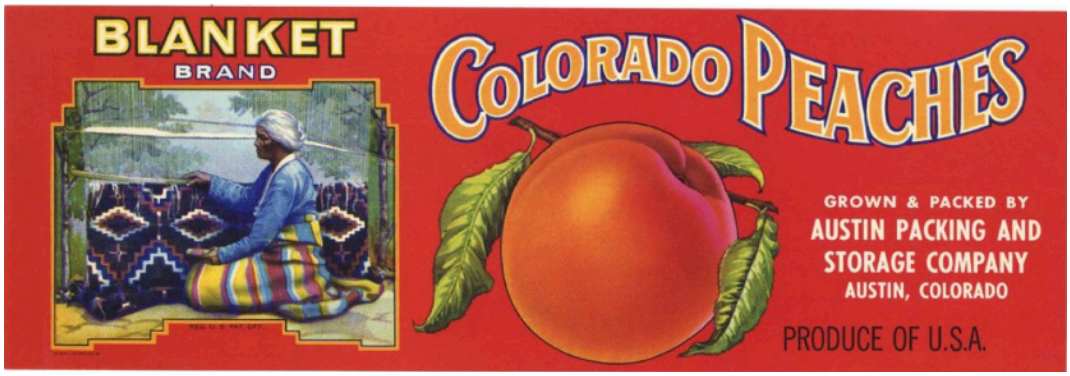
Fruit Belt Electric Railway, Grand Junction, Colorado—The Visitors to the Next Horticultural Convention Will Be Given a Ride Over This Line to View the Orchards of the Grand Valley

Figure 23: An electric interurban railway moved people and crops between Fruita and Grand Junction, years 1910 - 1928. (Colorado Board of Horticulture Report, 1912)

One orchard trend that unusually began in the West before the East, was the use of wooden crates vs hardwood barrels to store and ship fruit because of the shortage of hardwood in the west. These wooden boxes could be stacked with increased packing efficiency making it easier to transport fruit by refrigerated railcar to distant - including eastern - markets. Growers in western states learned that eastern consumers often had a preference for western fruit, in part, due to the fact the fruit was shipped in crates and did not contain rotten fruit in the bottom of a barrel.[72]

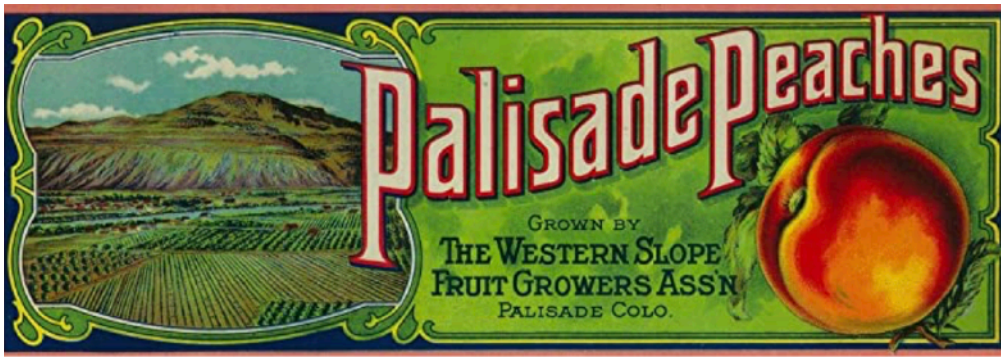
In tandem with the use of crates vs barrels, western growers were the first to market their crops with colorful, attractive labels showcasing the fruit and landscape. Vintage fruit labels in Colorado can still be found through an internet search for all orchard regions except for the Northeastern District. It also became commonplace in the West to use stereotypical, racist images and symbols of Native Americans to advertise fruit, and Colorado was no exception. Not long after confining the Utes to the southwestern corner of Colorado, growers in the Southwest and Western Districts began to incorporate Native imagery into their fruit labels.

[72] Kerrigan, 2015



Figures 24, 25, & 26: Vintage fruit labels using stereotypical, Native American imagery: (top) Blanket Brand, Colorado Peaches, grown and packed by Austin Packing & Storage Company (thelabelman.com) (middle) Montezuma Brand, Mountain Grown apples, grown and packed by E.W. Neal, Dolores, (Montezuma Orchard Restoration Project) (bottom) Tom Tom Brand, Mountain Grown cherries, distributed by United Marketing Exchange, Delta (thelabelman.com)

Figures Figures 27, 28, 29, 30: (top left) Royal Gorge Brand, Apples, grown and packed by The Round Crest Fruit Co, Canon City (Royal Gorge Museum & History Center), (top right) Montezuma Valley Fruits, growers McElmo Orchard Co, Cortez (Montezuma Orchard Restoration Project) (middle) Postcard displaying a doctored photo of Loveland cherries (Reporter Herald) (bottom) Palisade Peaches, grown by The Western Slope Fruit Growers Association, Palisade (allposters.com)



As growers learned to market their fruit, grower associations where formed, often with the encouragement of extension agents, to establish quality standards, develop and implement marketing strategies, and build lobbying capacity. Fruit maturity, color, quality, grades, and packaging were standardized to meet competitive markets. An early example, is the Grand Junction Fruit Growers Association that was established in 1893 and operated over the years with changing structure from corporation to cooperative.[73] All of Colorado's fruit districts have examples of grower associations, but the Western District historically had the highest concentration, to additionally include: the North Fork Growers Association, Peach Growers Association, Delta County Fruit Growers Association, Montrose Fruit and Produce Association, Hotchkiss Fruit Growers Association, Crawford Fruit Growers Association, and others.[74] These cooperatives operated over the years with varying degrees of success. As noted by E.P. Sandsten, marketing was the growers' biggest problem, and that co-operative growing associations offered the most satisfactory solution to the problem, but "*There is one big defect in the system - the average farmer will not co-operate*."[75]

Figure 31: People pose by the North Fork Fruit Growers Association Warehouse No. 2 in Paonia, 1908. A boxcar is behind the building on the tracks of the Denver & Rio Grande Western railroad. (Denver Public Library Special Collections)

[73] Sexton, 1986

[74] Hight, 2019

[75] Sandsten, et. al., 1917, p. 15

STATE GOVERNMENT INVOLVEMENT IN FRUIT INDUSTRIES

In Colorado, the State Bureau of Horticulture was organized in 1891 and in 1893, renamed the State Board of Horticulture; the State Board receiving, theoretically, an appropriation to assist fruit growers. Originally this board's purpose was to help the growers self-organize for the betterment of a Colorado fruit economy. The board worked in collaboration with educational institutions and growers received informative materials such as the State Board of Horticulture Reports. By about 1915 the State Board of Horticulture Report was replaced by the Report of the State Horticulturalist.

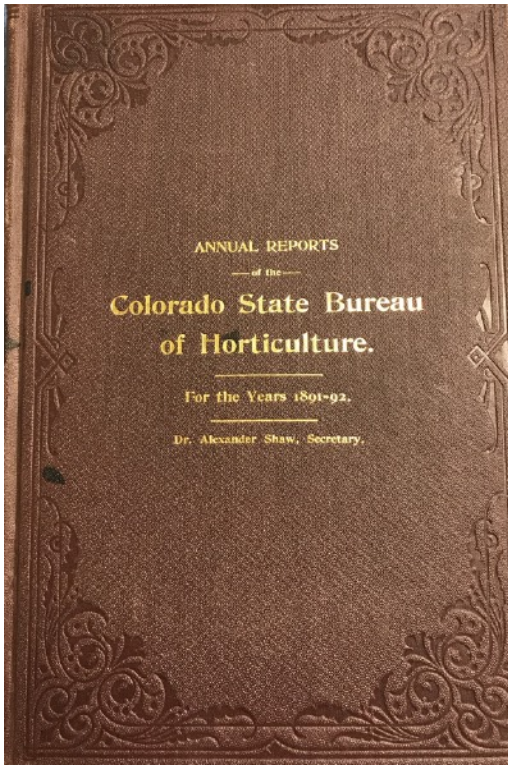


Figure 32: Annual Reports of the Colorado State Bureau (later Board) of Horticulture were written years 1891 - 1912. (Colorado State University Archival Collection)

Early on, growers relied on each other to gain knowledge of conditions unique to Colorado though they also enjoyed correspondence with other growers across the country and pomologists at the fledgling U.S, Department of Agriculture. With the establishment of state land grant universities following the Morrill Act of 1862, federal policies of standardizing agricultural practices and education increased.

The 1914 Smith-Lever Act established a system of cooperative agricultural extension services connected to the land-grant universities which solidified the influence of state and federal agricultural officials at the local level through the County Cooperative Extension Service. Professors from Colorado Agricultural College advised growers of pests and disease problems. Potions infused with iron sulfite and arsenate, sold under the names of Paris Green, Bourdeaux mixture, and lead arsenate were common formulas sprayed into an orchard.

In 1890 and 1891, Dr. Charles S. Crandall, of The State Agriculture College, undertook the first extensive on-site survey of commercial orchards in Colorado for the purpose of reporting the "fruit interests of the state".[76] Going district by district, Crandall documented varieties present and numbers of trees in each district. Work of this kind, but more detailed, was repeated in years 1917 and 1922 with the Sandsten (et. al.) orchard surveys. They record not

[76] Crandall, 1891

only the number of trees in each district, but the number of trees in each orchard - down to number of trees per variety.[77] It was not until 2014-present that detailed orchard survey work has been repeated through the efforts of Montezuma Orchard Restoration Project, Apple Core Project, and Boulder Apple Tree Project. The earliest surveys were conducted to promote Colorado fruit varieties and share information among growers. The present-day surveys share this purpose with the additional goal to to preserve Colorado's fruit growing heritage while saving many of the same varieties (even trees) that were first recorded.

Sarah M. Burnett, of Poncha Springs, was the rare female county horticultural representative to the State Board meetings held in Denver in the early 1900s. Though women were shut out of most leadership roles two women emerged in the early 1900s that would have a significant, but understated role in the orchards of Colorado.

Miriam Palmer, entomologist, artist, and professor, was not allowed to teach certain classes at Colorado Agriculture College (now Colorado State University) because she was a woman. However, she persisted and became a world class expert on aphids. Her drawings and wood block engravings of insects are exceptional. In 1905 and 1906 Palmer began documenting apples found at Colorado State Fairs, first in watercolors, then in wax casts.[78] [79]

Figure 33: Miriam Palmer's collection of wax apples are now safely archived at Colorado State University. Linda Meyer (left), Jude Schuenemeyer (right) (Montezuma Orchard Restoration Project, 2020)

[77] Sandsten, 1917, 1920, 1922

[78] Hansen, 1974

[79] Nearly lost several times, the Palmer wax apple collection is now secure in the Colorado State University archives. In conducting research to write this context, Montezuma Orchard Restoration Project located the collection sitting in unopened boxes in a professor's office wrapped in newspaper dating back to the early 1970s, likely the date they were last viewed.

Beginning in the late 1890s, Martha Shute was the Secretary of the Colorado State Bureau - later - Board of Horticulture (SBH) for at least a dozen years. Shute was the link between growers within the state, other state agencies, and officials from other states and the USDA. Her promotion of Colorado fruits helped build and professionalize the industry. Job responsibilities entailed obtaining crop information from growers, editing and organizing all board documents, including the SBH reports, and organizing horticultural shows and displays. "*The secretaryship of this organization is not a snap. It requires a live, energetic person and one familiar with the horticultural interests and resources of the entire state, and one that, when it comes to fairs and exhibits, will say " Come on," instead of saying "Go on*"."[80] Martha Shute was the graft that connected the organization. She was briefly removed, because she was a woman, but then reinstated because she was good at her job. "*Some not being satisfied, succeeded in replacing her with a man, but I believe that most of us were very glad to reinstate the present secretary [Shute].*"[81]

FACTORS THAT USHERED IN THE NEXT PERIOD OF FRUIT HISTORY

At the beginning of this orchard period, growers learned that altitude, cold, heat, drought, and winds made Colorado a daring prospect for the development of a fruit economy. Imagination and persistence would eventually overcome climate and skepticism, creating the foundation of an industry that could grow with the population. While early growers dug the irrigation ditches, imported fruit varieties, built the trade and developed practices that made fruit growing in Colorado possible, societal and industrial changes increased the number and location of orchards. As Colorado passed from a Territory into Statehood in 1876, the fruit industry momentum grew. However, several factors would coalesce during the end of the 1800s which would forever alter the history of orchards in Colorado.

Codling moths lay eggs that become worms in the apples. They were not a pest of note in Colorado until the late 1880s. When established in fruit orchards, they spread infesting crops and decreased the value of the harvest until apples became unprofitable. Lead arsenate began to be used in 1890 as a solution to control moths and it was used in large orchard operations across Colorado. However, moths soon developed resistance requiring the chemical to be applied in greater amounts and frequency, further driving up costs of production. With the loss of economic benefit in orchard operations, land values, especially near the cities became

[80] Colorado State Board of Horticulture Report, 1901, p. 113

[81] Colorado State Board of Horticulture Report, 1901, p. 113

attractive and developmental pressure became irresistible. *"Land near Denver is too valuable to be devoted to the purpose of raising apples to feed and perpetuate the codling moth."*[82] (Jay Garrison)

During this time the Native American people were forcibly removed from western Colorado. This opened "new areas" to fruit growing. A fruit grower in Mesa County stated, *"This county has a great area of the choicest fruit-lands, and, like the other counties, began planting fruit-trees in the fresh tracks of the receding Utes."*[83] The Colorado State Bureau stated in 1891, following a welcoming address by Rev. Bayard Craig, *"He was quite eulogistic of the happy transformation that had resulted in the horticultural line by planting fruit trees in the tracks of the receding Indians, but nine years ago."*[84] On the Western Slope and in southwest Colorado, lands opened for orchard establishment. Initially believed to be a wasteland, early grower, William E. Pabor peered into the Grand Valley and saw the future in orchards. Apples still dominated, as yet they were free of codling moth and developmental pressures. But the Grand Valley had a climate that supported the growing of peaches and sweet cherries. Colorado's fruit economy began to slowly shift from east to the west of the Rockies.

Transportation, and the nation's populations shifting from farm labor to factory labor, put a premium on long keeping shipping apples. Early on, growers realized that a box car load of red apples sells better than yellow or green apples. Jonathan and Rome Beauty became favorite apples for their red color and fresh eating quality. Then in 1895, Stark released the Delicious. Finally, here was an apple as adaptable to the north as it was to the south, east, and west, for its ability to grow and bear fruit.

The original Delicious is more of a yellow apple overlaid with red stripes, and has little resemblance to the Red Delicious now found in grocery stores. Apple trees have the ability to grow an anomalous limb on which the fruit on the limb is different from the rest of the tree. Sometimes these limbs revert to the original cultivar, occasionally they remain deviant. As the Delicious, patented as the Red Delicious in 1905, gained popularity their sheer number of trees planted allowed for numerous sport varieties to be discovered.

Most of the over three hundred sport varieties were selected for their deeper red color and increased shipping ability. They were considered more shelf stable because their skin turned red before the apple flesh was fully ripe. The unripe, hardness of the fruit increased its ability to withstand bruising during shipping. The exceptionally sugary taste and high flavor of the

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[82] Colorado State Board of Horticulture, 1902, p. 34

[83] Colorado State Bureau of Horticulture, 1891-92, p. 104

[84] Colorado State Bureau of Horticulture, 1891-92, p. 174

original Delicious was lost. Though Colorado proved to be an excellent climate for growing quality Delicious apples, if they survived the spring frost, the commodity markets became saturated with fruit from other growing areas of the latest sport variety.

In 1887 Congress passed the Hatch Act, establishing in every state federally funded research stations associated with universities or colleges. Focusing on profitability through increased quality and yield their agents and bulletins would work to standardize crop production. For orchard crops, these standards included uniform spraying, grading of fruit, and the belief that more trees of fewer varieties increased grower profitability. Protection from spring frosts through the use of orchard heating became more critical when orchards planted with fewer varieties became more prone to complete crop failure.

Though the trend took longer to develop in Colorado, by the beginning of the 1900s state agents were teaching growers how to top-work their trees into standard varieties. This spelled the end of diverse orchards and the decline of their important genetic diversity in Colorado.

Top-working is the method of changing one variety to another. By the 1920s many of the early diverse orchards had been top-worked to Delicious, Jonathan, and Rome. Evidence of top-working is seen on old trees remaining in today's historic orchards. Montezuma Orchard Restoration Project has found single limbs on these top-worked trees that are below the top-work and are part of the original graft, often representing rare and endangered genetics.

> *In the first planting of orchards twenty-seven years ago, we tried something like one hundred and sixty kinds of apples, not knowing whether any or all of them would grow and bear fruit, or what kinds would be salable or fit for use or to market. They all grew and began to bear heavy crops. We had all kinds of summer, fall and winter varieties. Some fifteen or twenty worth-less varieties of hardy Russian apples that the unscrupulous tree gents from the East had sold us at $15.00 per dozen, telling us that nothing but the very hardiest kinds would ever succeed in the vigorous climate of Colorado. We began at once to top work or graft over, until at present most of these old orchards are now producing good commercial apples of a few varieties.*[85] (W.S. Coburn)

[85] Colorado State Board of Horticulture, 1908, p. 60

Figure 34: Written by hand on sleeve that stored photo, "Western slope fruit investigations. April 23, 1906. Showing row of Maiden Blush apples worked over to Jonathan. Anjou pears in full bloom in the background. O. B. W." If you look closely at the Maiden Blush limbs that have been cut down to stubs there are small pieces of Jonathan scion wood grafted on to become the new tree. This photo is part of the Colorado Agricultural Experimental Station Records Collection: fruit investigations. (Colorado State University)

Pressure from insects and development, the "opening" of western Colorado, state and county agriculture agents, railroad transportation, and the continuing shift from agricultural labor to factory workers all combined to change the nature of Colorado's orchard economy. These trends happened more gradually in Colorado compared to national trends in the east, but by 1920, the types of fruit planted and dominate growing regions began to shift patterns.

Towards the end of this period, the initial diversity of fruit genetics, and the resiliency of self-made growers began to lose out to the monoculture of standard varieties, the regime of institutional processes, the pests and diseases of abundance, and the development needed to

house an increasingly populous state. Orchards on the Front Range began to be removed in favor of development, whereas, remote lands on the Western Slope were "opened" to "new" settlement. This caused the fruit industry to gradually grow and shift to Montrose, Delta, and Mesa counties, eventually making the Western District the dominate fruit growing region.

> *The development of these Counties [Montrose, Delta, Mesa] has been phenomenal. In the tenth year after the removal of the Ute Indians and the opening of the reservation to settlement, the growers of these Counties place before the public the largest and finest exhibition of fruits ever shown in the State, and the best the writer ever saw in any State. The first planting of fruit was made in Delta County in 1882, and soon after small areas were planted in Mesa County. It was not, however, until the year 1886 that planting became general. The wonderful growth and precocity exhibited by the trees first planted on the North Fork and about Grand Junction and Fruita served to prove the adaptability of the soil and climate to the raising of fruit, and a large area was planted that year.*[86] Charles S. Crandall

This, and most of what we know about Colorado's first orchard period is located in early board of horticulture reports. They provide a detailed historical record, often in the growers' own words. However, towards the end of this period the board reports are replaced by an individual report of the state horticulturalist, and soon cease to exist. Agriculture extension agent reports for each county pick up the historical record. These reports are formal and bureaucratic lacking the multiple voices and group discussion of the horticulture reports. While still full of information, their focus shifts to home economics, weed and pest control, grain crops, and 4-H. The degree to which fruit is discussed in the extension reports is as much of a factor of who is the agent at the time irrespective of the status of the fruit industry in their region. Therefore, there is less of a comprehensive historical record to inform our research on the next two periods in Colorado's fruit growing history.

[86] Crandall, 1891, p. 15

Spraying an Orchard—Showing Proper Apparatus for Doing Effective Work.

Figure 35: Spraying an orchard. (Colorado Board of Horticulture Report, 1912)

Copyright, 1911, by P. H. Troutman.

Smudging the Troutman Orchards, Canon City, Colorado

Figure 36: Orchard heating using smudge pots on a cold night in Canon City, 1911. (Colorado Board of Horticulture Report, 1912)

HISTORY OF COLORADO FRUIT ORCHARDS: 1920-1945

PERIOD TWO: ORCHARD STANDARDIZATION AND INDUSTRIALIZATION

Figure 37: Twenty varieties of apples from growers in Cedaredge were displayed, in conjunction with the State Seed Show at Colorado Springs, to better advertise Colorado apples. (Colorado Agriculture College Extension Service, Box 120 CSU archives, Annual Report, 1931)

The fruit industry passed from the pioneering planters of Frazer, Brothers, McClelland, De Weiss, Rockafellow, and others, to a new generation removed from the ideals of the persons that had come before. State and federal involvement in agriculture became dominant. Fruit festivals and fairs that where established across Colorado's orchard districts to celebrate growing agricultural abundance, either shrunk in size, ceased to exist, or shifted focus.

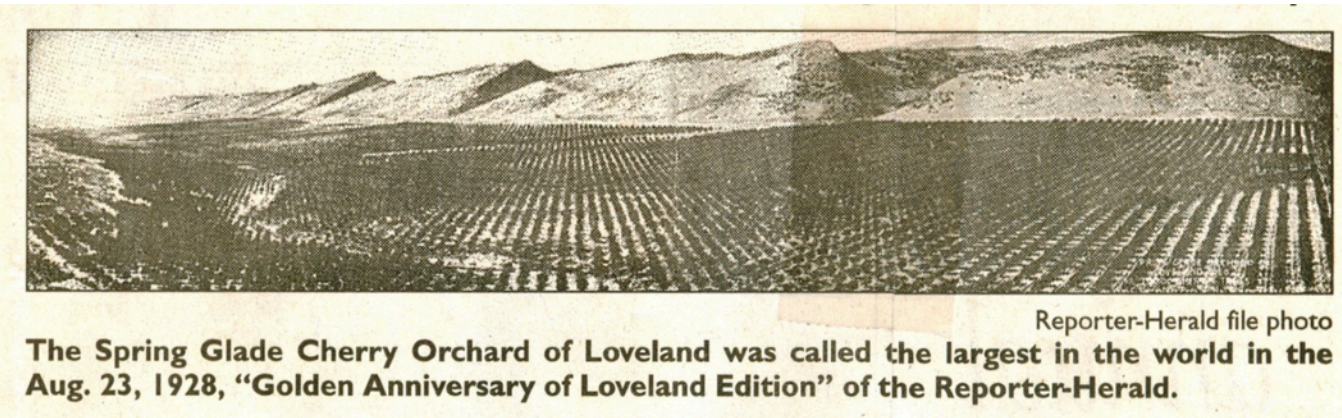
Following World War I through the Great Depression, the fruit industry in Colorado was not exempt from the decline of agricultural economies experienced on a national level. For example, the value of all fruit produced in western Colorado declined from $3,442,120 to $933,490 during the years 1921 - 1930. However, by 1945, apple production in western

Colorado increased by 746,205 bushels from 1940.[87] Effects of World War II on the industry would play a main role in ushering in the next era of fruit growing.

During each decade of this period, the Colorado population increased by near or above double digit numbers. The tractor replaced the mule. Tourism became as recognized an industry as mining. Steady population increases transformed Colorado from frontier to cosmopolitan.

ORCHARD DISTRICTS & CHARACTERISTICS OF ORCHARDS

By 1920, Colorado had four established fruit districts. The **Northeastern District** still had apple orchards, but many of the old orchards were being converted to houses, especially near the cities. North, around Berthoud and Loveland, an explosion of pie cherry tree planting was underway. Tart cherries, used in pies, were selected for their cold hardiness needed to survive the harsher conditions of the northern Front Range. *"In 1888, Montmorency and Morella sour cherry orchards covered 10,000 acres, earning Loveland the reputation as the region's best area for raising cherries in Colorado. Spring Glade Orchard was the largest cherry orchard west of the Mississippi River. In 1928, 1929 and 1930, the orchards produced more than $1 million worth of cherries."*[88] Loveland held its first Cherry Blossom Festival in 1930 to celebrate the growing industry. Overtime, the event was renamed the Cherry Pie Festival when blossoms became a memory of the past as orchards were replaced by development with names like Cherry Hill Estates and Orchard Shopping Center.[89]



Reporter-Herald file photo

The Spring Glade Cherry Orchard of Loveland was called the largest in the world in the Aug. 23, 1928, "Golden Anniversary of Loveland Edition" of the Reporter-Herald.

Figure 38: Development to include shopping malls and million dollar ranch estates have replaced the Spring Glade Cherry Orchard of Loveland. (Reporter Herald)

[87] United States Department of Interior, last updated November 20, 2021

[88] Aughenbaugh, 2006

[89] Loveland Museum, 2020

In the **Southeastern District**, Fremont County remained dominate in production despite challenges of frost, disease, and insects. Apples were still widely grown, but a similar increase in pie cherry varieties occurred there as well. In part, due to government regulations surrounding the use of lead arsenate that increased production costs of apples. Following one crop destroying event after another, the Fruit Day Festival, later named Blossom Festival, that had begun in Cañon City in 1894 with abundance - *"It was a good fruit year and 16 tons of fruit were given away - plus several barrels of cider were consumed"*[90] - started to shift its focus away from fruit to music. The region also begun to be better known for its prison system vs fruit industry.

Figure 39: A diversity of fruit on display at the first Apple (Fruit) Day in Canon City, 1894. The event was later known as Blossom Festival and continues today with less of a focus on fruit (Royal Gorge Regional Museum History Center)

The remoteness of the **Southwestern District** consigned peaches to a local crop. Apples planted in the high valleys of the San Juan Basin thrived, and were shipped to markets by boxcar loads on the narrow gauge railroad, and later by truck as the roads improved. In

[90] Robertson, 2020

Montezuma County fruit growers had organized county fairs beginning in 1902 that coincided with the fall apple harvest. However, they ceased to occur in 1918 when "*The Influenza Epidemic broke out in Montezuma County immediately following the County Fair October 1st 2nd 3rd and 4th*."[91] They did not resume until 1945 when organizers announced the "First Annual Montezuma County Fair"[92] seemingly having culturally forgotten the events held decades before. Fruit was still a focus of these revived fairs, but with less diversity.

As codling moths destroyed apple and pear crops in the lower parts of the Western District growers switched mostly to peaches in Mesa County. The first Peach Day [known today as the Palisade Peach Festival] was held in Grand Junction in 1891 and lasted until 1923.[93] It was revived as the Peach Festival and held in Palisade in 1930, but no festivals were held throughout 1950-60.[94] Around Cedaredge, in Delta County, where its elevation is over 6,000 feet, the codling moth never became endemic. The cool nights at altitude decrease the moths activity. As Mesa County went more into peach production, apple production increased in Delta County. Nearby Paonia became known for its annual Cherry Day celebration, one of Colorado's longest continuously running festivals since 1946.

Across Colorado's orchard districts, numbers of plantings initially remained stationary. Old trees were removed, new trees were planted. The notable exception was the expansion of the fruit industry on the Western Slope and particularly the rise of peach planting in Palisade, near Grand Junction after the health and planting of apple orchards declined. Whereas the 1800s were a time of experimentation and diversity for orchards and orchard fruits, the first half of the 20th century was a period of orchard standardization and monoculture. This transition occurred through the influence of trained government horticulturists promoting defined ways of growing, combined with a population that was becoming more concentrated in cities, more industrialized, and less tied to agricultural rhythms and traditions.

For orchard growers these forces resulted in larger orchards where fruit was not one of many farm crops but the crop. Consumers were living farther from the farm. Fruit that bore regularly and could withstand shipping became grower favorites and household standards. Delicious, Jonathan, Rome Beauty, and Golden Delicious apples would crowd out all other varieties. The introduction of refrigeration for storage and transportation in the 1920s, and its

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[91] Colorado Agriculture College Extension Service, Annual Report, Montezuma County, 1919

[92] Colorado Agriculture College Extension Service, Annual Report, Montezuma County, 1949

[93] Hight, 2020

[94] Palisade Historical Society, 2018

increased use by the 1940s, replaced the demand for seasonal apples and doomed many varieties to extinction.

Following the example of "Piggly Wiggly" in 1916, grocery stores became self-serve. Retailers lacked shelf space and a knowledgeable sales staff capable of explaining numerous varieties of fruit and their uses. Fresh produce sales were an established commodity market where success came from selling large numbers of items at a small profit, allowing the economy of scale to dominate.

As the number of varieties contracted and orchard size increased, home orchards were pushed out of the markets. Larger enterprises became the standard of competition. Orchard trees were still planted on seedling rootstock at a spacing of 25'x25' or greater. By the late 1930s, most of the apple seeds used for seedling rootstocks came from Delicious apples, a trend that would continue through the 1950s.

During this period orchards were grand, park-like landscapes with long rows of widely spaced trees, producing seven hundred to fifteen hundred bushels per acre. Unlike the old diverse orchard trees that ripened over several months, these less diverse orchards bore fruit over a month to six weeks.

DEVELOPMENTS & INNOVATIONS AFFECTING FRUIT INDUSTRY

The rush of a large crop in a short period of time necessitated large labor crews often growing beyond what a family could furnish. Wheat farmers, bean farmers, and Native Americans became the labor source for the fruit harvest. "Housewives" became favored workers for orchard owners. They were available in the fall after their kids had gone back to school. They needed cash for Christmas presents and winter, and these women were often regarded as the hardest working, best pickers.[95] During the war years, as labor grew scarce, migrant workers from Mexico were welcomed. Their need was especially felt and appreciated in the expanding orchards of Mesa and Delta counties.

Existing orchards in Colorado that were just far enough from cities and the developmental pressure were maintained, but top-worked into "standard" varieties. Close to Denver, orchards were removed for development. Around Cañon City, extension agents paid orchard owners to remove their trees, with a premium going to the oldest of the apple trees trees

[95] MORP conversations with Montezuma County fruit growers Leon Risenhoover, Chuck Neal, and Joyce Greenlee, 2007-2016.

which were considered to be neglected and infested [not sprayed], and of the the least commercial value due to the diversity they represented. This ineffective policy of removing historic apple trees as a way of eradicating codling moth would continue throughout the 20th century.

Along the northern Front Range many growers increased their planting of tart cherry orchards as the profitability of apples declined due to codling moth. Early Richmond, Morello, and Montmorency cherries found a good market in the pie bakeries of Kansas City, and Chicago. Cherry grower associations were formed, and with close cooperation with the agricultural college and extension services, the area extending from Longemont to Wellington became a renowned spot for large pie cherry orchards with Loveland at its heart. *"The cherry industry in the Loveland area began in 1890s, but boomed in the 1920s and through the 1960s. Loveland had over seven processing plants at different times from 1920s-1960s. Three of the largest canning companies included Kuner-Empson, Loveland Canning and Cherry Products Corporation."*[96]

The Grand Valley was initially productive with apple, pear, and peach trees, and a million dollar fruit crop at the peak of production in 1911. But many orchards had been sold to investors who had little knowledge of irrigation or horticulture. It was eventually noticed by growers that trees on the low end of the rows began to die, and then this condition would work its way up the rows killing trees higher up in the orchards. Eventually it was discovered that overuse of irrigation was causing the build up of salts in the soil, which resulted in necrosis of the trees. By the late teens apple orchards in Mesa County were left unkept, victims of soil salt, and codling moth.[97] Just east of Grand Junction, in Palisade, peaches began to thrive. Growing peaches was difficult at best along the Front Range due to extreme temperature fluctuations and dehydrating winds. However, in the loamy soils and hot sunny days, the peach would thrive and the Palisade district would become known as one of the greatest peach growing areas in the United States.

The timing for the rise of peaches could not have been better. As apple orchards declined and the future of the Colorado fruit industry came in doubt a new crop free from codling moth, fireblight, and competition from Washington State apples allowed the western district to gain dominance. Delta and Montrose counties increased their production of apples and peaches but at the relatively low elevations around Grand Junction, with increased pest and disease pressure, apples declined.

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[96] Loveland Museum, 2020

[97] Sexton, 1986

In southwestern Colorado, apple production flourished, particularly in Montezuma County. The standardization and industrialization of the period were experienced in the region. Apple varieties declined, although orchard size became larger, planted with the popular Delicious, Jonathan, and Rome. In the 1940s, the Runck orchard introduced refrigerated apple storage into the Montezuma Valley, complete with concrete loading dock and a large attached packing shed. Apples were placed on conveyors with mechanical rollers to aid in sorting and packing. Area growers worked for decades to compete in the commodity market even shipping fruit to other states including California and Texas. However, the high altitude orchard belt (6,500' to 7,000'), and resulting late frosts that often destroyed the uniform blossoms of the few varieties then grown, created problems for growers as they turned towards industrialization and standardization.

In the heart of this period, the tractor, which could turn under a hundred acres for every acre done by person, animal, and plow, would conspire with drought to set the eastern plains into a desperate land. People were displaced, farms and dreams swallowed by the dust and debt. Farmers who lost their land on the eastern plains blew west, including into the orchards of western Colorado.

Some of the migrants worked on the commercial orchards established by the Burrell Family, across the upper western edge of the Montezuma Valley where Rome Beauty, Jonathan, and Delicious apples were planted.[98] The Burrell Family is best known for the Rocky Ford Seed Company located in Otero County. Counties in Colorado that were severely impacted by the Dust Bowl include Otero, Baca, Las Animas, and Prowers counties. Of these, only Otero County had a commercial fruit economy before the Dust Bowl. This economy had already begun to decline prior due to spring frosts and orchard neglect. In 1922, Otero County was home to 60 commercial orchards representing 29, 699 trees, the majority were sour cherries followed by apples.[99] By 1935, there is no mention of fruit cultivation in the Annual Report of the Extension Service for Otero County. There is, however, discussion of crops (corn, barley, oats, wheat, sugar beets, and alfalfa) and soil reclamation activities.[100]

On a spring day in 1945, nearing the end of World War II, members of the Galloway family were planting their orchard in Montezuma County - with Delicious, Rome Beauty, and Winesap apple trees - when the news came of the death of Franklin Roosevelt.[101] The most

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[98] MORP conversations with Montezuma County fruit grower Chuck Neal, 2007-2010

[99] Sandsten, *Orchard Survey of Arkansas Valley*, 1922, p. 19

[100] Colorado Agricultural College, AEXT Report for Otero County, 1935

[101] MORP conversations with Montezuma County fruit grower Leon Risenhoover, 2014

profound impact on Colorado's orchards during the war was the impact on labor with many young women and men leaving the orchards to fight in, or otherwise support the war. The labor force turned to migrant workers. In 1941, the Palisade Migrant Labor Camp was established on the land that is now Riverside Park. The camp had 200 cabins to house Mexican workers and their families that helped with the Grand Valley fruit harvest. The camp remained in use until 1962 as even after the war there was still need for more workers.[102]

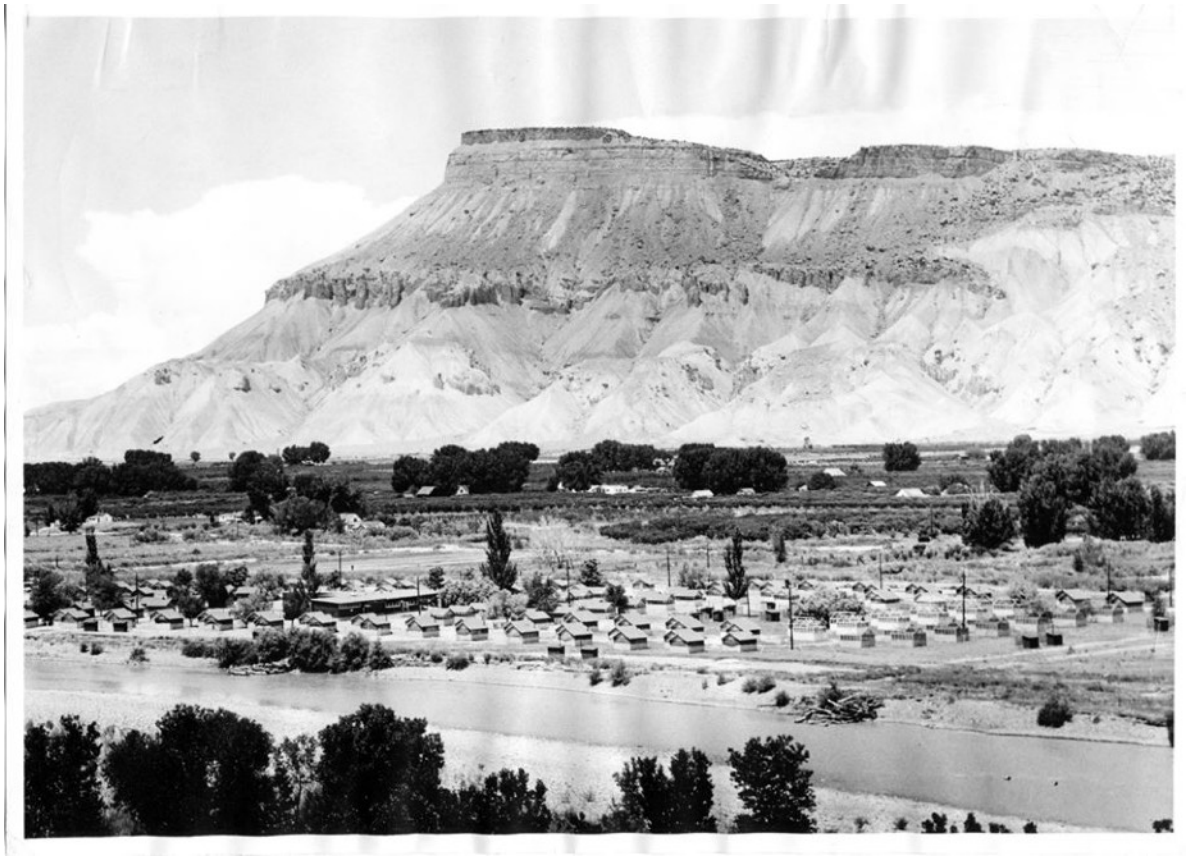

Figure 40: Migrant Labor Camp, Palisade Riverbend, circa 1954. The location is today known as Riverbend Park where many festivals are held including the Palisade Peach Festival. (Steve and Denise Hight, https://www.facebook.com/HistoricalFruitaPhotos/)

STATE GOVERNMENT INVOLVEMENT IN FRUIT INDUSTRIES

Within a decade after it was established in 1914, the influence of the Cooperative Extension Service was felt in every fruit district in Colorado. Education and research were used to encourage farmers and citizens to adopt certain techniques. Farris M. Green, the Superintendent of the Western Slope Branch of the Colorado Experiment Station in Austin

[102] Hight, 2019

was of particular influence. Records located in the archives at Colorado State University show Mr. Green providing workshop demonstrations in orchards, throughout the years 1930 - 1957, on topics including pruning, top-working, fruit grading, and marketing. According to extension agent reports, these workshops and farm tours were well attended and met with enthusiasm from growers.

In Montezuma County, leading fruit growers including Eri Neal were advised to *"secure the top-working of undesirable varieties of apples to Delicious, Rome Beauty, and Jonathan."* Following workshops led by Ferris Green on top-working and pruning, Mr. Neal stated that the skills he learned *"meant an average increase in future income of $150.00 a year to him."* [103]

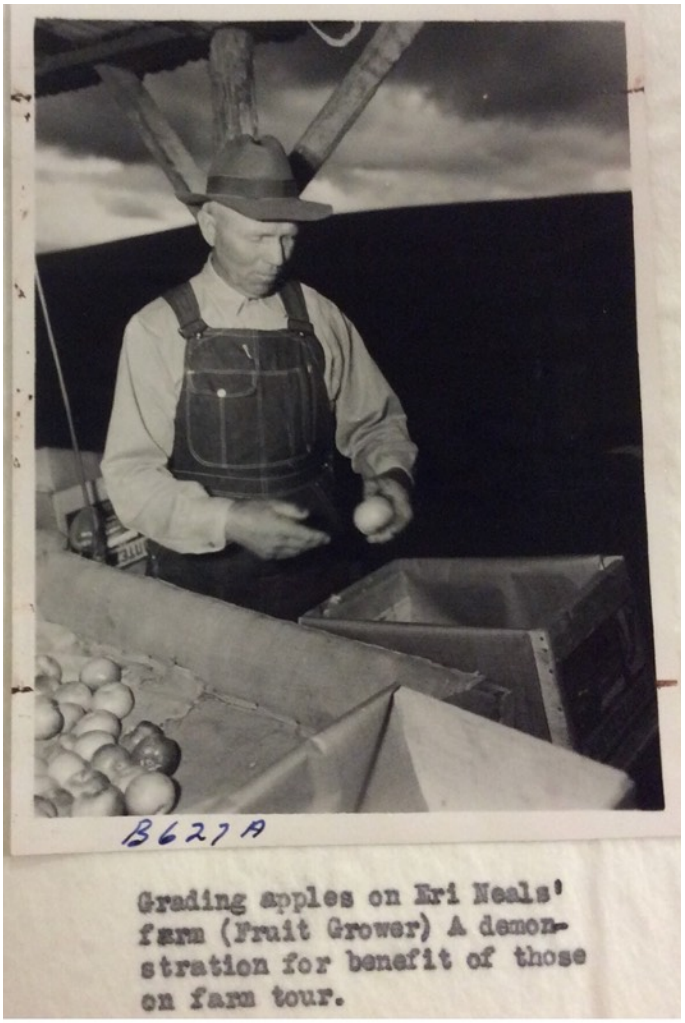

Figure 41: Montezuma County fruit grower Eri Neal demonstrating how to grade apples. (Colorado Agriculture College Extension Service, Box 58, CSU archives, Annual Report, Montezuma County, 1947)

[103] Colorado Agricultural College, AEXT Report for Montezuma County, 1947

Figure 42: A good turnout at a farm tour in Montezuma County. (Colorado Agriculture College Extension Service, Box 58, CSU archives, Annual Report, Montezuma County, 1947)

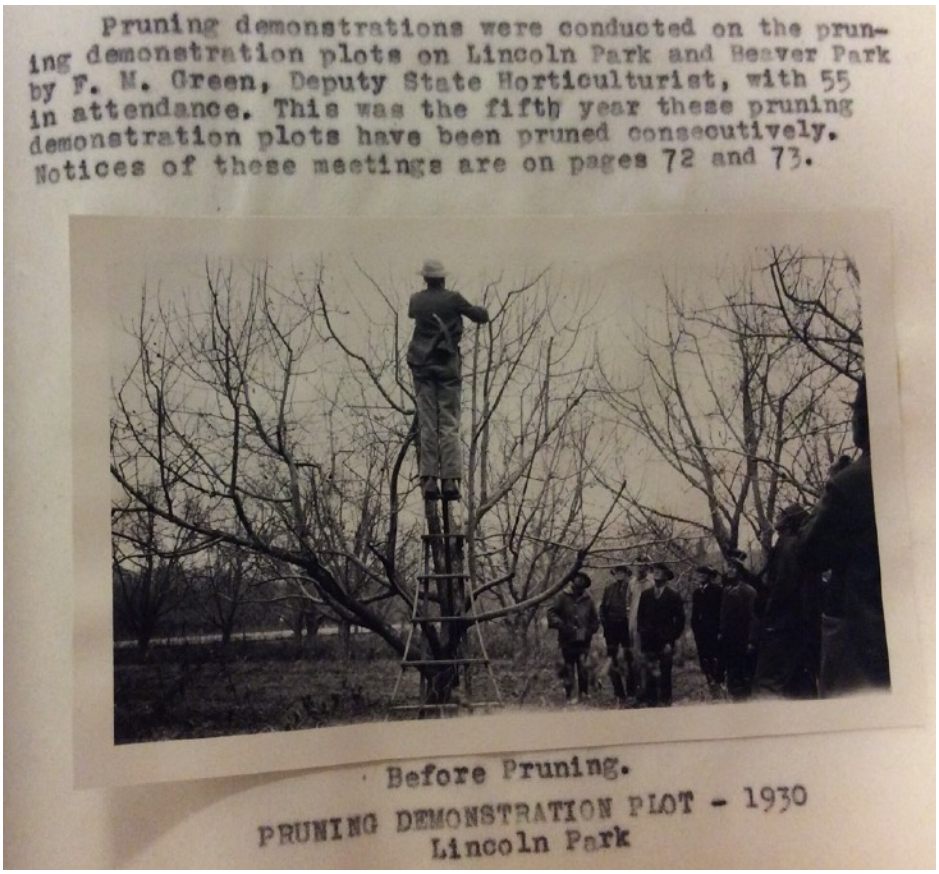

Figure 43: A well attended pruning demonstration in Fremont County (Colorado Agriculture College Extension Service, Box 28, CSU archives, Annual Report, Fremont County, 1930)

In 1925, the state prison administration in Fremont County purchased the Colorado Packaging Corporation when it recognized the potential profits in fruit and vegetable canning. Formerly known as the privately owned Round Crest Canning Company, the prison paid $40,000 ($600,000 when adjusting for inflation) for the company. Still using the Round Crest label, the prison cannery was one of the best equipped and efficient in the state. This efficiency, combined with low labor costs, made the prison cannery difficult for private canneries to compete with. However, some growers in the area did benefit from cheap prison labor that harvested their crops for sale to the the prison cannery.

The prison system of labor did not necessarily benefit the economic interests of the fruit industry. …*"the dangers of running a prison as a business extend past the virtual enslavement of inmates to the potential injury of local industries facing higher labor costs*." The inmates were not always enamored with the work. The June 11, 1931 *Cañon City Daily Record* reports of the disappearance of an inmate, "*Cherry canning presumably loses its lure for George Albanese, State prison trusty*." The Colorado Packaging Corporation began to lose money after the Hawes-Cooper Act of 1929 banned the interstate trade of convict made goods. The Great Depression caused the end of private sector canneries, though the prison cannery continued operating at a loss until the late 1960s.[104]

Figure 44: Women workers processing apples at the Colorado Packing Corporation in 1916 were soon replaced by prison labor when the company was purchased by the state prison system in 1925. (Royal Gorge Regional Museum History Center)

[104] Colorado College History Department, 2021

In 1933, the passage of a federal law limiting lead residues on fruit[105] resulted in the requirement for growers to wash their apples to conform to regulations. In Fremont and Mesa counties where there had been high use of lead arsenate to control the codling moth, growers were concerned about the added cost of production to wash their fruit, causing some to spray less than extension agents recommended. In 1935, Fremont county agent stated,

> *The passage of a state law requiring apples to conform to [federal] Pure Food regulations on spray residue has caused much antagonism on the part of growers, who are of the short-sighted opinion that they will spray only once at the most [versus recommended 4-5] , and thus avoid washing their apples. Low prices and no sale for apples at this time are discouraging factors. However, improved practices must be put into effect, or the apple industry in this county must give way to something else.*[106]

The extra expense of spraying at high frequency, and then washing the fruit multiple times, further reduced the profitability of apple growing in all fruit districts of Colorado. If the apples were washed too many times they were at risk of bruising in shipping. The problem was compounded further when codling moths became resistant to the chemical, requiring even greater frequency and rate of application.

FACTORS THAT USHERED IN THE NEXT PERIOD OF FRUIT HISTORY

Between 1920 and 1946, many orchards near the cities were lost to development pressure. Codling moth caused the replacement of apple orchards for peach planting on the Western Slope, and pie cherries along the Front Range. New apple orchards were still being planted in favorable locations but with only a small fraction of the varietal diversification that was characteristic of earlier orchards.

Orchards continued to grow into larger enterprises with narrower harvesting windows requiring greater labor inputs. The trees themselves were still grafted onto seedling rootstock creating 20-25 foot tall trees planted in 25x25 foot rows. Growers relied more on agricultural agents for knowledge as the demands for high production increased with the size of the orchards.

Though not widely used in America before World War II, several strains of dwarfing clonal rootstock were imported into this country from Europe following World War I due to the

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[105] Schooley, et. al., 2008, p.32

[106] Colorado Agriculture College Extension Service, Annual Report, Fremont County, 1935

desire for increased farm productivity on fewer acres as land became more scare. These dwarfing clonal rootstocks would change the geometry, appearance, and culture of American orchards,[107] and define the next period of fruit growing in Colorado.

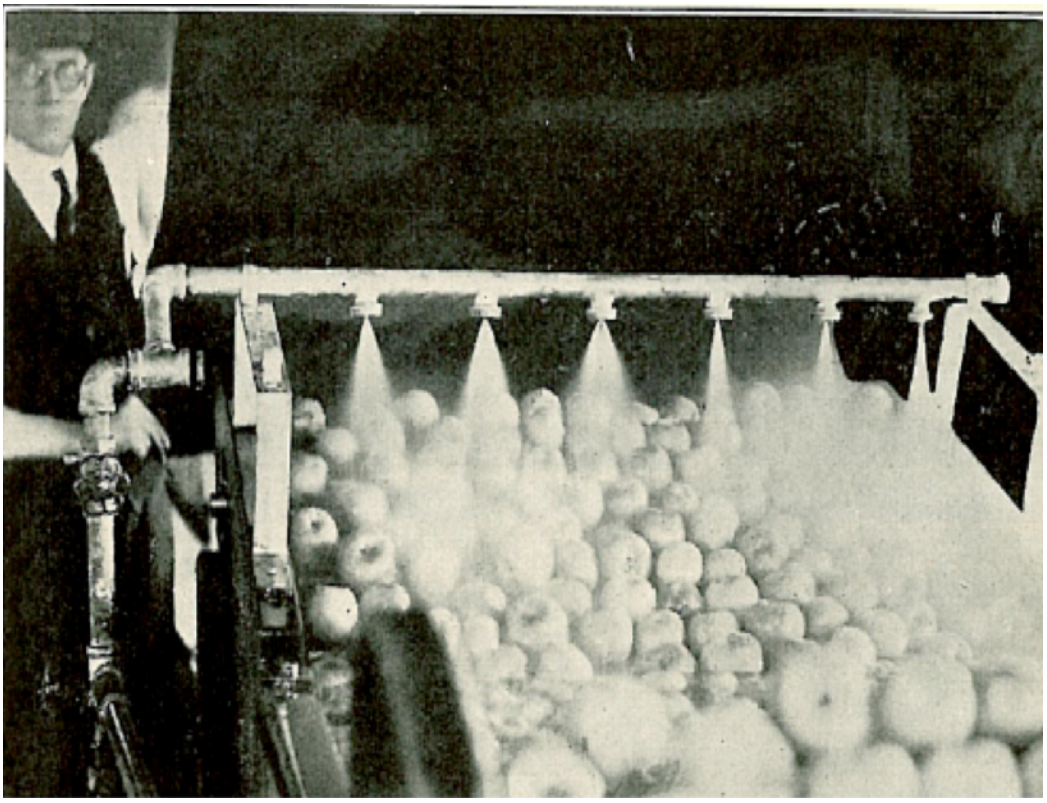

Figure 45: Apples being washed with water and acid bath to remove lead arsenate residue. (Schooley, et. al., p. 32)

[107] Dolan, 2009, pp 117-118

HISTORY OF COLORADO FRUIT ORCHARDS: 1946-PRESENT

PERIOD THREE: FRUIT MONOCULTURE AND ORCHARD INTENSIFICATION

Figure 46: Proudly Picking a Red Delicious Apple, Delta County, circa 1979. (Author Family Photo)

Sports, Spurs, and Dwarfs

"All living things have three powers inherent in them, the power to fight for their self preservation, ...the power to recreate themselves in progeny, ... and the power to vary." Luther Burbank

The Western District was the only fruit growing region of Colorado to fully transition into this next orchard period dominated by monoculture and dwarfing rootstocks. The fruit industry began to become a memory of the past in other regions, although old trees remained in place, especially in the Southwestern District.

Occasionally apple trees will grow a limb that is somewhat different from the main tree. With orchard trees this could be a limb on which the fruit is better colored or earlier to ripen. Often these "sports" as they are known revert to the characteristics of the parent tree after a few years, but sometimes these traits are fixed. When a desirable sport is found, normally of redder color or earlier ripening, they are propagated and marketed.

The very trend of monocultural orchards, characterized by many trees of few varieties, created a critical mass of individual types of apples with higher frequencies of notable mutations. These new sports in turn produced new sports which could be patented, and consistently sold as the latest and greatest.[108] Red sports are more deeply colored than their parents. They get

[108] Dolan, 2009, p. 126

redder sooner. The skin exhibits a greater appearance of ripeness than is the actual ripeness of the flesh. Red sport apples are harvested before they are ripe, allowing for greater consistency of the crop in controlled storage.[109]

Not all sports are chosen for color. A grower in Washington State, in 1948, noticed an unusually heavy crop on one of his Red Delicious trees. The tree had many short "spurs", the lateral branching that bears fruit, as opposed to just setting fruit on the tips of the branches. Besides having a heavier crop, spur trees are also naturally semi-dwarfing allowing easier harvesting, and a greater number of trees can be planted per acre. Still grown on seedling rootstock, spur varieties could be planted closer together but still with enough spacing to allow growers to use existing tractors and other equipment to maintain their orchards. Because of their natural tendency to dwarf, spur varieties were one method to control the size of orchard trees.[110]

Growers in Europe, and to a lesser extent in the eastern United States, started to utilize dwarfing rootstocks that would decrease the size of the tree. Out west, the first effort to uniformly control the size of the tree itself was done through the selection of spur varieties. This trend would continue into the 1980s, though dwarfing rootstocks also emerged simultaneously.[111]

In England, just before WWI, researchers at the East Malling Horticultural Research Station began to propagate cuttings from dwarf seedling apple trees that they had collected from allover Europe. Dwarfing rootstocks had been known for centuries, but here was an organized effort to find the most consistent rootstocks, and through their use control the size of orchard trees. This work would change the geometry, culture, and eventually the very types of apples grown.[112]

By the 1950s, twenty-six types of dwarfing rootstocks were selected because of their vigor, adaptability, or dwarf size. Numbered from one to twenty-six, of these the EM.7, a 50% dwarfing tree, became one of the most popular across the country, as well as in Colorado orchards. Unlike fully dwarfing rootstocks, which require vineyard style trellising, tighter row

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[109] Dolan, 2009, p. 126

[110] Dolan, 2009, p. 124

[111] Dolan, 2009, p. 118

[112] Dolan, 2009, p. 117

spacing, specialized pruning, and smaller machinery, the M.7 rootstock is free standing. It does not need support to keep from falling over from the weight of the crop.[113]

Trees on M.7 could be planted at a 10'x18' spacing allowing for 240 trees per acre as opposed to the roughly 70 tree per acre of older style orchards. Growers could continue to use known pruning styles, and use their tractors with more yield per acre. Dwarfing trees also bore fruit a few years earlier than seedling rootstocks and were easier to harvest due to their shorter height. The 1957 historic Hall/Olson orchard in Montezuma County is an example of an early transition to dwarfing rootstocks with Rome and Delicious alternating blocks of rows.

Predictably, growers started noticing red spur and red sport combinations. These red-spur-sports grafted onto dwarfing rootstocks would become the dominant varieties in commercial orchards with Delicious strains leading the way. By the 1980s about a half of all apples grown were some type of Red Delicious, closely followed by Golden Delicious.[114]

In this abundance of uniformity, where sports of just a few varieties were highly selected for their appearance of ripeness and shiny red skin, the quality of flavor was neglected. The once famous flavor of the Delicious became not so delicious. Several Colorado growers described the popular Stark Crimson Delicious sport as tasting like "cardboard" or "sawdust."[115]

While different varieties like Granny Smith started to be planted in Colorado's orchards in the early 1960s, it was the appearance of fresh new varieties, shipped across oceans from Japan, New Zealand, and Australia in the 1980s that forced modernization of orchard growing systems. Delicious apples were ripped out, trellis systems were installed, and new varieties like the Gala and Fuji were planted, especially in Delta County.[116]

Old style orchards were meant to be passed from generation to generation. A strange feature of modern orchards is the expectation of growers to tear out their shorter lived dwarfing trees after about ten years and plant new varieties. Growers have become aware of consumers' sense of brand obsolescence. The new apple today will be gone from favor, soon enough,

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[113] Dolan, 2009, p. 117

[114] Dolan, 2009, p. 77

[115] MORP conversations with Montezuma County fruit growers Leon Risenhoover and Joyce Greenlee, 2014-2015

[116] MORP conversations with Colorado fruit growers Chuck Neal, Monica Noland, Steve Ela, and Dan Williams, 2014-2020

replaced by the next great apple. High density dwarfing orchards facilitated and encouraged this varietal crop rotation.[117]

WHAT HAPPENED TO THE FRUIT INDUSTRY IN COLORADO

Figure 47: The diversity of apple varieties represented in this 1930s photo soon disappeared from commercial cultivation and many became functionally extinct. However, fruit explorers are finding these rare genetics in Colorado's historic orchards, including the Colorado Orange apple, that is displayed in the first row above the table, center right and center left. (Colorado Agriculture College Extension Service, Box 28 CSU archives, Annual Report, Fremont County, 1931)

With the rise of industrialized agriculture, most of Colorado's fruit industry was unable to compete on the economy of scale. Despite the genetic diversity of our area's first orchards, farmers soon turned to commodity crops realizing that a boxcar of shiny red apples sold better than one of mixed varieties. The rise of Washington State apples, decline of the railroad, remoteness, pests and disease, market fluctuations, failure to meet quality standards, fuel and labor shortages, orchard killing and late frosts, development pressure, and replacing trees in favor of hay production, proved challenging.

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[117] Dolan, 2009, p. 123

New orchards that were being planted at this time, especially in Mesa and Delta counties, were spurred by the introduction of the pesticide DDT. It was used during World War II and became widely used in agriculture by 1945. Here was a "safe", cost efficient, and highly effective chemical that could wipeout codling moth, which had grown resistant to lead arsenate. DDT was also useable on oriental fruit moths affecting peach crops. With DDT, the west slope orchards experienced a rebirth into this new era of high density plantings on dwarf rootstock.[118] The use of DDT was banned in 1972 followed by lead arsenate in 1988.

Organic growers, once considered fringe, are now commonplace especially in Delta County. Hippies moved to the region in the early '70s helping to grow a culture and demand for healthier foods and farming practices. Biological controls, beneficial insects, and cultural practices have replaced DDT, organophosphates, and nicotine type pesticides. Many conventional farmers in Colorado, who used synthetic pesticides for generations, switched to organic practices. In 2003, Ela Family Farms became the first 100% Certified Organic 4th generation farm in Colorado where they grow over 55 varieties of organic tree fruits.

Migrant labor, mostly from Mexico, continued to be an essential component in nearly all commercial orchards in Colorado during the post-war era. More trees per acre meant more work per acre. With crops ripening over a short time frame, many hands were needed to pick, sort, and pack the fruit. Migrant farm labor continues to be highly valued and appreciated in Mesa and Delta counties today.

Despite the come and go nature of their success, co-operative growers associations and packing houses, begun in earlier eras, remained critical to the marketing, packaging, and sales of fruit. Additionally, they were an important tool in managing collective problems in orchards. This was true of peach growers in Palisade, apple growers around Cedaredge, and cherry growers in Larimer County along the Front Range. When, in 1946, the presence of Cherry Fruit Worm threatened to destroy the half a million dollar industry, the Northern Colorado Cherry Growers Association began publishing a bulletin that informed growers as to the nature of the problem and efforts needed to eradicate the pest.[119]

Pie cherry growers in the **Northeastern District** were just recovering from wartime shortages of rubber and sugar required for canning when in the early 1950s a precipitous temperature drop in November killed large numbers of trees. Blossom killing frosts in the early 1960s further decreased the commercial viability of orchards over the post-war housing boom.

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[118] Sexton, 1986

[119] Colorado Agriculture College Extension Report, Larimer County, 1946, p. 70

In the **Southeastern District**, the expansion of the state prison facilities and the related increase in jobs and housing, pushed out many orchards in Fremont County. It also made it difficult for new plantings and new innovations to take hold. Other farmers down the Arkansas River sold their water rights to the expanding suburbs, the land returning to a time before cultivation.

In the **Western District**, both Mesa and Delta counties adopted spur types of apples and varieties on semi-dwarfing rootstocks. When the apple market crashed in the 1980s, spur Delicious strains were top-worked into Gala and Fuji. High density hedge systems, where trees are planted on dwarf rootstock very close together, became more common. To decrease codling moth pressure, Delta County had a pest enforcement board that would remove neglected apple orchards if the owner did not, at the owner's expense.[120]

Though consumer interest in local and heritage foods continues to increase, especially among apple enthusiasts, apple production is decreasing in Colorado. Multigenerational grower Steve Ela estimates that there has been a 75% decrease in apple production since 2000 in Delta County. Sharp drops in apple crop value during the early 2000s convinced many growers to switch to peaches. Up until then, Delta County grew apples like Mesa County grew peaches; about 75% apples in Delta and 75% peaches in Mesa.[121]

While some peach orchards remain around Olathe, and the west end of Montrose and San Miguel counties still contain magnificent old apple orchards, the large orchards that once covered much of the land around Montrose were pushed out for pasture decades ago. Sweet cherries are still culturally important in the Paonia area with the annual Cherry Day celebration. However, this tradition is at risk as old trees die and fewer new ones are planted.

Peach orchards have occasionally lost ground in Mesa County to wine grapes, but have proven profitable enough to gain ground back. Apples never recovered there as the dominant crop, but the peach industry continues to thrive. The demand for Palisade peaches today represents Colorado's main fruit industry despite highs and lows over the decades caused by the the Great Depression, boom-bust mining economy, peach mosaic virus, cytospora canker, and development pressure spurred by the oil and gas industries.

Talbotts Farms is the biggest peach producing and packaging operation in the state. The sixth-generation family business began the tradition of fruit growing in 1907. When Bruce Talbott began running his grandfather's Talbott Farms in Palisade, there were about 20,000 apple

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[120] MORP conversations with Western District fruit growers Steve Ela and Dan Williams, 2020

[121] MORP conversation with Delta County fruit grower Steve Ela, 2020

trees that yielded about 90 percent of their total fruit production…in 2016, there were 1,000.[122] They no longer pack apples, although they turn them into juice and cider, and today grow mainly peaches, plus grapes and pears. Hi-Quality Packing, the main handler of apples, closed its doors in 2015 after a crop failure shut down the packing line. For over 6o years the company had stored, marketed, and shipped area apples, peaches, pears, and apricots. Worried about what to do in coming seasons, area growers convened that year to discuss options, including forming a cooperative, in part to avoid being forced to sell individually at low prices to Kroger and Walmart.[123]

Consolidation of corporate grocery stores, with one large grocer buying out another to become even bigger, caused produce buyers to have less connection to growers or awareness of what makes Colorado fruit so unique. It is easier for the buyers to make one call for a large shipment rather than work with multiple growers or packing sheds. The year Hi-Quality closed its doors, Dan Williams of Williams Orchards offered their own facilities to help other growers get the little bit of fruit they had to market. Dan cautioned (although was not opposed) against a cooperative as he valued the independence they had grown with their business. Others in the room felt the same way, and it was pointed out that throughout the years cooperatives had come and gone largely due to the challenge to maintain strong leadership/management. The discussion was tabled for the future.[124]

Williams Orchards has grown fruit on the Western Slope for 100 years and five generations. They are a leader in introducing modern and innovative farming techniques, including - over the years - wind machines for frost protection, micro sprinklers for water conservation, hail netting, and the first high density trellis system that allowed them to plant thousands of trees per acre versus 45-70. Similar to Talbotts they have diversified their operations by entering the cider business, and similar to Ela Family Farms, they now grow all organic fruit. All of these multigenerational fruit growers have put orchard land and water in Land Trusts in hopes for continuation of their family orchard businesses for generations to come.

Apple growers in the **Southwestern District** tried to market their crops well into the ‘50s, even finding markets in California when the dominant Washington State suffered a codling moth infestation even worse than Colorado’s. However, by early 1970 the fruit industry in the region declined. Distance from major transportation systems had always and continues to be a challenge for fruit growers in the remote region. While the orchards planted in the prior

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[122] O’Conner, 2016

[123] Sunderland, 2015

[124] Sunderland, 2015

decades remained productive, the difficulty of getting a perishable product to distant markets made upgrades in growing methods and packing standards unprofitable. The oil embargo of the early 1970s ended the exportation of apples from Montezuma County as the truckers could no longer afford the gas.[125] The large orchards sat mostly untouched until the Mountain Sun Juice Company opened in Dolores in the 1980s. The orchards sat dormant again after the juice plant closed less than twenty years later,[126] but the location of the plant is now home to a start-up cider business.

The growing cider industry in Colorado creates an expanding market for locally grown fruit, and provides hope for the future of the orchard and associated industries. Several orchard operations on the West Slope have added hard cider production into their business models including Talbotts, Big B's, and the Williams' Snow Capped Cider. Several cideries in the Denver metropolitan area, Clear Fork Cider, Colorado Cider Company, and Haykin Family Cider, have added orchards across the state. In 2016 the St. Vrain Cidery opened as the first cidery in Boulder County in modern times. The historic Penrose district in Fremont County has gained the notice of cider makers, C Squared ciders relocated there. Stem Cider planted an orchard at their cidery in Lafayette. Teal, Fenceline, and Eso Terra cideries are utilizing Montezuma County apples that for decades went un-harvested.

Colorado's orchard history is now mostly forgotten. The last generation that grew up with the spring snow of apple blossoms in Cañon City, in the Montezuma Valley, along Fossil Creek in Fort Collins is passing, and with it their cultural knowledge of all that was possible. Orchards, especially apple orchards, and the old time varieties that are still found growing in Colorado, have a place in our future. As growers face increased price competition from foreign markets, and bombardment of a new variety Cosmic Crisp from Washington State, it would appear that our future comes from our past. The work of Colorado's early fruit growers was a gift to us, and a compass towards our future.

Figure 48: Eso Terra Cider operates in the same building that once housed the Mountain Sun Juice Company, Dolores. (David Alcindor, 2020)

[125] MORP conversations with Montezuma County fruit growers Chuck Neal and Adel Roundtree, 2014-2016

[126] Holden, 2001

RESTORING COLORADO'S HISTORIC ORCHARDS

Figure 49: Montezuma Valley Apples, crop of 1911. Diversity of size, shape, and even color is evident. (Joyce Lawrence)

Colorado's historic orchard trees have survived for more than a century, sometimes nearly a century and a half, individually, and in groups in every historic orchard district across the state. They have proven their ability to grow strong and bear fruit for generations of people fortunate enough to be in Colorado for their harvest.

In the remote Southwestern District, Montezuma County once won three of the four Gold Medals awarded to Colorado for its fruit at the 1904 St. Louis World Fair. Remnants of the work of early growers are what led to the creation of Montezuma Orchard Restoration Project (MORP) some 100 years later when co-founders Jude and Addie Schuenemeyer realized just how many old trees still grew here- quite often with the descendants of settlers who planted these old orchards still living on the original farms or in the area.

For nearly two decades, Montezuma Orchard Restoration Project has worked to preserve Colorado's fruit growing heritage and restore an orchard culture and economy to the southwestern region. MORP believes that the remarkable orchard culture and economy that once thrived there can again be possible through its diverse program work of preservation, education, and outreach. Through orchard and grafting workshops, school and community

orchard establishment, genetic preservation, orchard restoration and harvest, apple tree sales and donations, preservation through documentation, and direct engagement with knowledgeable people, an active interest in heritage orchards is again taking hold.

By searching historical books, reports and records, MORP has so far documented nearly 500 varieties of apples that were planted in Colorado prior to 1930.[127] Many of these apples are still found growing in Colorado's landscape on trees 100 years old or older. Others, nearly 50% of the list, are now considered lost/extinct. This great diversity disappeared not because these varieties did not grow well here, rather because many were simply not shiny red apples representing the standard of the time. MORP works to find and preserve as many of these varieties as it can to Colorado orchards. Impacts as of 2020 include:

- 6,377 heritage apple trees grafted
- 1,344 trees sold to the public
- 1,441 trees donated to research, school, and community orchards
- 2,166 students directly reached through hands-on grafting workshops and presentations on Old Colorado Apples and Colorado's Fruit Growing History

As part of this project, MORP expanded its Old Colorado Apples list to connect historic grower to varieties grown, location grown, and awards won. Although this is a work in progress it has so far documented over 130 historic growers, connecting them to over 200 apples grown.[128]

E.P Sandsten (et. al.) of the Colorado Agricultural College's experimental station who surveyed every orchard district in the state from 1917-1922, not only documented what fruit varieties were growing in Colorado, but inventoried quantities grown in commercial orchards at that time, down to the age and condition of the orchards. In MORP's work to survey and identify varieties in Colorado's historic orchards it likely has retraced Sandsten's footsteps putting many of the same trees he documented in the early twentieth century "back on the map."

To date, MORP has compiled a list of nearly 300 historic orchard sites located in Colorado. Of these, MORP has mapped and documented just over 100 sites containing 4,000 apple trees that are each 80 to 135 years old. In addition to old trees MORP documents associated historical features such as homestead houses and cellars, and tools of the trade like presses, boxes, and ladders.

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[127] See appendix "Old Colorado Apples"

[128] See appendix "Growers and Varieties"

Before mapping work begins, MORP creates an orchard narrative to include contact information, general condition of the orchard, and interview notes with the orchard owner capturing as much historical information connected to the orchard site as possible. Rare apple genetics and memories or orchard owners are equally significant, and together create a powerful story.

All this information is collected on paper and entered into the MORP Orchard Database along with GPS points, field notes, historical research, and photographs. MORP is still deep in the data collection phase, but as part of a future project will share this information (with permission from orchard owners) with both the public and fellow fruit explorers. Although MORP has made progress documenting Colorado's historic orchards, there remains an urgency to build upon this work before more of Colorado's historic apple varieties are lost.

Orchard survey work, funded in part through a Specialty Crop Block Grant, made it possible for MORP to submit 490 leaf samples for identification by DNA analysis to the USDA Agricultural Research Service in Fort Collins. The analysis identified 196 unique varieties, 138 of which did not match varieties previously DNA tested and therefore represent rare or endangered varieties not located in national or private collections. It is probable that many of these are historic named varieties considered functionally extinct such as the Colorado Orange apple. DNA results also match to 34% of the named varieties listed on Sandsten and Thompkins early surveys confirming the endangered diversity still located in Colorado's historic orchards. Now that we have captured some of these rare and endangered genetics it is essential that MORP preserve them into perpetuity. As heritage fruits continue to gain the interest of gardeners, farmers, orchardists, horticulturalists, consumers, cider makers, and other fruit enthusiasts through MORP's program work and national trends, old Colorado apples have an urgent and rare chance to be to be renowned again.

Montezuma Orchard Restoration Project is a national leader in heirloom orchard preservation and restoration. It has inspired and informed similar projects elsewhere including Lost Apple Project in Washington state; Budwood Cooperative in Montana; Boundary County Orchard Restoration Project in Idaho; and several groups in Colorado: the Apple Core Project in San Miguel County and Boulder Apple Tree Project at University of Colorado. Two other fruit preservation projects in Colorado include Widespread Malus based out of Boulder and the Heritage Apple Tree Project based out of Basalt. The ever-increasing number of preservation groups in the region is a reflection of just how many old trees remain west of the Mississippi, and of the urgency to save this unique heritage before it is lost. Together, these old trees and the descendants of early growers, create a living history that is valuable to hold onto and preserve for future generations.

OTHER HISTORIC ORCHARD CROPS IN COLORADO BESIDES APPLE

Figure 50: U.S. Department of Agriculture Pomological Watercolor Collection. Rare and Special Collections. National Agricultural Library. Beltsville, MD 20705

As the Western Slope and southwest regions opened, Colorado now had prime ground to grow peaches and sweet cherries. Palisade, near Grand Junction, and McElmo Canyon, west of Cortez, became famous for the quality of their peaches. Paonia, in Delta County, would become the center of the sweet cherry industry.

Luther Burbank's introductions of Japanese plums, Satsuma and Santa Rosa plums, would also find favorable growing conditions west of the Continental Divide. Luther Burbank was a self-taught botanist who's first of nearly one thousand plant introductions was the Burbank potato. He helped turn plant breeding into a modern science, creating hundreds of new strains and varieties of flowers, vegetables, grains, grasses, and fruits. He introduced over 100 varieties of plums alone, including the juicy, aromatic Japanese plums. By 1917, Burbank's Satsuma Japanese plum was the most commonly grown plum variety in the Palisade District, with his self-named Burbank plum being the third most planted at Palisade.[129]

The trends of orchard ground lost to development and the need to plant more trees per acre influenced peach, pear, and cherry orchards in the state. Though work on clonal dwarfing rootstocks for these other fruit crops was done concurrently with apples, there was less impact on the industry. There is less natural tendency for other fruits to mutate as easily as apples, which means there is less variation in dwarfing strains for plant breeders to work with.[130]

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[129] Sandsten, et al, 1917, p. 39

[130] Dolan, 2009, pp. 132-138

Though most pear orchards are planted on seedling rootstocks from Bartlett pears, a transition has been underway to plant new pear orchards onto semi-dwarfing clonal rootstocks of the Old Home x Farmingdale (OH X F) series. Though these rootstocks were developed in Oregon in the 1980s the rootstocks were originally derived from a cross between the Old Home and Farmingdale pear varieties that were discovered on a homestead in Farmingdale, IL, in the 1910s.[131]

For years, Colorado pears were a favorite of buyers from the Gerber Baby Food Company.[132] As the Gerber Company was bought and sold the relationships between growers and company became more distant until new buyers no longer wanted to mess with the low volume of Colorado pears. Today pear production in Colorado is minimal.

Peaches too are still planted mostly on seedling rootstock, though St Julian semi-dwarfing plum rootstocks are popular for peaches. Because of the consistency and adaptability of Lovell Seedling rootstocks they are still commonly found in Colorado orchards. During the 1970s growers began utilizing hedgerow planting systems for peaches replacing traditional 15 x 20 foot planting grids with trees planted at a 10 x 8 foot spacing doubling the number of trees to 500 per acre.

The wild sweet cherry rootstock, Prunus avium Mazzard, has been and continues to be the most common rootstock for sweet cherries. Prunus cerasus Mahaleb, a naturally semi-dwarfing sour cherry is and has been the most popular rootstock for pie cherries. These two varieties of cherry rootstocks were hybridized in England in the 1960s producing the Colt series of cherry rootstocks. Unfortunately this new series proved to be less adaptable in cold climates like Colorado. The later released Gisela rootstock series from Germany is still being experimented with but has yet to have a significant impact in Colorado.[133]

Plums and apricots traditionally were grown on seedling rootstocks from similar fruit. The East Malling Research in England began developing selections from the Myrobalan seedling plum, releasing several semi-dwarfing Myrobalan rootstocks by the 1960s. The East Malling Research Station also released the hardier and more dwarfing St. Julian rootstock in the 1960s.[134]

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[131] Dolan, 2009, p. 132

[132] MORP conversation with western fruit grower Dan Williams, 2020

[133] Dolan, 2009, pp. 133-135

[134] Dolan, 2009, p. 138

These other orchard fruits experienced a similar weening of varieties though not as dramatic as the genetic loss that occurred with apples. Red Haven emerged as the dominant peach, Bartlett became "the pear", Bing and Montmorency dominated sweet and sour cherry markets respectively. Plums have always been a minor crop in Colorado and continue to be so with Elephant Heart and Satsuma still growing in orchards with Stanley and Damson plums, mostly for fresh market sales.

Though occasionally utilized on the Front Range these advancements were mostly adopted in the still commercially viable Western Slope. Orchards did not completely disappear from the historic Southeastern and Northeastern fruit districts but their geographic and economic impact dwindled.

MORP's primary focus has been apples due to the number and diversity of trees that still survive in the landscape. However, the historical records also have detailed lists of pears, plums, peaches, cherries, apricots, and small fruits that were historically grown in Colorado. MORP looks forward to giving these other fruits the attention they deserve once we have the capacity to do so.

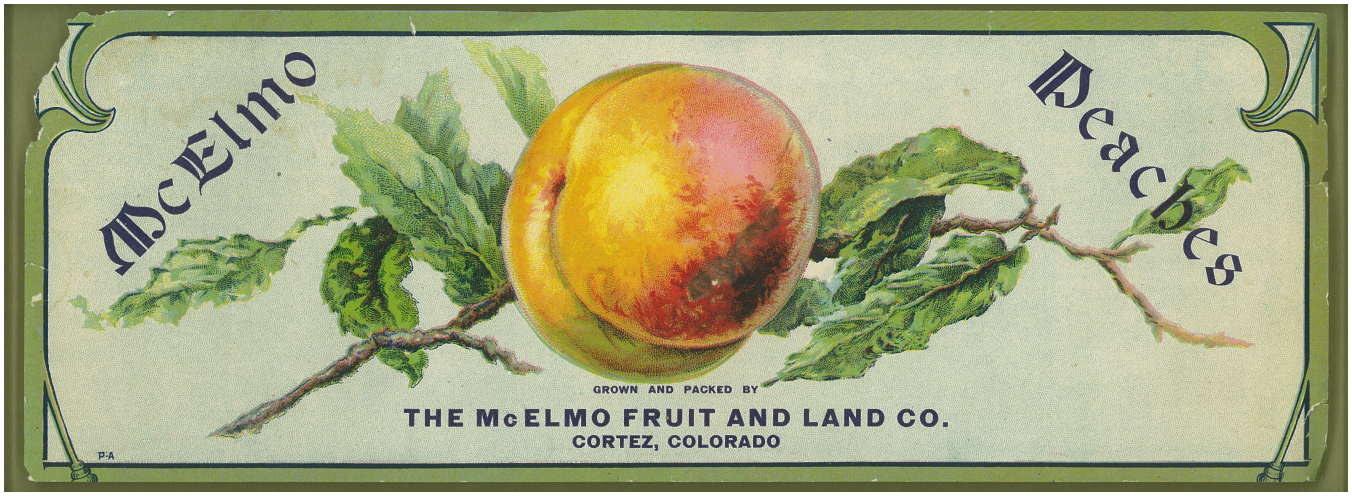

Figure 51: McElmo Peaches label from the early 1900s. Spring frosts, perishability and distant markets limited them to a local crop.(Montezuma Orchard Restoration Project)

CIDER AND PROHIBITION

Any apple can be crushed into must, the thick juice of apples. You can then drink it fresh as juice (soft cider), or allow it to ferment as the naturally occurring yeasts on the apple skin metabolize the sugars. When exposed to oxygen, cider becomes vinegar. In cask or barrel, protected from the air the juice becomes alcohol or hard cider. Cider specific varieties are apples that are so bitter or astringent as to cause the face of any would be taster to pucker uncontrollably. They are only used to make hard cider.

In England at the dawn of the twentieth century, traditional, also known as "proper" cider was in resurgence. At the Long Ashton Research Station, qualities of cider specific apples were studied, typically bitter sharps and bitter sweets, also known as "spitter apples". In these tannic apples with their complexed flavors English orchards could again gain relevancy through the cider they produced. These cider specific apples allowed English orchards to build markets not in competition with the fancy fruit (fresh eating) imports of the latest apple trending from America.

In America, fermented cider was a regional industry, primarily in the east, using available orchard apples. By the 1880s, most apples in the United States were grown for eating, whether baked, dried, sauced, or fresh. Any excess crop was used for livestock feed, cider (soft and hard), or vinegar. Most of these were multi-purpose, non-cider-specific apples, although a few, such as Harrison and Hewe's Crab, developed reputations for making great cider. Vinegar was widely used and valuable product, especially for food preservation, and as a cleaning product.

Cider specific apples were not historically grown in Colorado, with rare exception, although they are found today as chance seedlings sprung from historic orchards. Throughout the US, early cider makers primarily used multi-purpose, non-cider-specific apples that they had on-hand. This blend of diversity created a juice of general goodness from the orchard, a Farmhouse style of cider unique to America. In old records, we find rare mention given to cider in Colorado. Mr. Jesse Frazer commented on the fine cider made by the Ben Davis which was was also one of the most popular fresh eating apples of the day. These infrequent mentions are unclear if they refer to fermented (hard) or non-fermented (soft) cider.

In the United States there is a popular narrative that prohibition led to the removal of cider orchards and their replacement with dessert, fresh eating type apples. However, there is no documentable evidence in Colorado or elsewhere that we have found to support the occurrence of orchards ever being chopped down en mass, or even occasionally removed because of prohibition. We have found the primary reasons most orchards were planted in the

first place were for multi-purpose (including cider) homestead use or for the fancy fruit (non-cider) commodity market. Apples were also the most widely adapted fruit from which vinegar was fermented in America. Apple cider vinegar was a common preservative and cleaning product, still is. Prohibition and the Temperance Movement in general did not affect Colorado's fruit industry in regards to either varieties selected or to its rise or decline.

MORP recognizes that prohibition - enforced in Colorado in 1916 and nationally in 1920 - did affect all alcohol production. However, a major reason why commercial production of hard cider was not part of Colorado's founding history was due to the development of the grain-based beer brewing industry. As German immigrants moved onto the Great Plains in the 1840s and 1850s, with ample single season grains that were easily fermented in quantity, beer displaced cider as America's beverage of choice. German Americans had transformed American into a beer drinking nation decades before Colorado became a territory.[135]

Indeed, the preferred taste for beers moved west with migrants to Colorado and breweries like Tivoli, Zang, and Coors were established. The beers had short fermentation periods and a ready market in the saloons in Denver. This shift followed the national trends of Pilsner and lager style beers displacing ales and cider. These commercial enterprises established during this period are well remembered. The Zang label is preserved, the Tivoli Brewery still stands, and Coors remains a popular brand. There are no similar stories, structures, labels, or history supporting the notion of a robust cider industry historic in Colorado. To date, there is also no evidence of large scale cider production in Colorado until the early 2000s.

[135] Schuenemeyer, 2020

COMPARISONS BETWEEN NATIONAL AND COLORADO ORCHARD HISTORIES

Time Period: 1600-1800 National

The first national period identified spans the years 1600 to 1800. During this time early colonial settlements were established along the eastern seaboard and the Spanish were exploring the southern states and moving into the Southwest from Mexico. Colorado was home to Native Americans. The Spanish were exploring the northern Spanish territory where they had established Santa Fe in 1609. Other than early explorations into Southwest Colorado in the late 1700s, permanent Euro-American settlement in Colorado had not yet begun.

Early colonial orchards were characterized by trees planted from seed, irregularly spaced, with mostly low quality fruit that could be dried, cooked, juiced, or used for animal feed. The trees grew tall with branching occurring above the heads of grazing livestock. These first orchards were part of a subsistence farm, not large commercial enterprises.[136]

Some refined European cultivars were grown by wealthy elites, carefully tended in walled fruit gardens. As more orchards were planted from seed some of these new seedling trees became favorite varieties. In the East, important cultivars were planted that would later find home in early Colorado orchards. The varieties Roxbury Russet, Rhode Island Greening, Esopus Spitzenburg, Newtown Pippin, Maiden's Blush, and Snow would be among the many colonial apples that would be planted by Colorado's early fruit growers.[137]

By the end of the 18th century, seedling apples, cherries, and plums were widely planted in the Northeast and into the upper Midwest. Peaches were dispersed across the mid-Atlantic states and into the South. Pears were a northern farm planting, with few commercial orchards of French varietals in existence.[138]

Time Period: 1801-1880 National / Pre-1920 Colorado

[136] Dolan, 2009, pp. 14-15

[137] Dolan, 2009, pp. 13, 19

[138] Dolan, 2009, pp. 30, 38

National Orchard History 1801-1880

As settlers spread out across North America, orchard trees came with them, sometimes as seed, sometimes as bundles of dormant, grafted trees in an ox-drawn wagons. Orchards were common features of homesteads, and helped to establish permanent ownership of property by demonstrating the continued crop production necessary for land patents. Whereas this was considered progress to Euroamericans, it was forced removal and genocide of Native Americans, whose even, well established apple and peach orchards were destroyed by American armies as "new lands were cleared" for settlement. Early on, Native Americans adopted New World fruits from English and Spanish colonists. Contrary to the dominate narrative, Native Americans, not white settlers, were the first to spread apple and peach seeds and establish orchards westward.

The planting or orchards through western expansion lead to an explosion of new North American varieties of fruit, especially apples. The 1800s would be known as the “Golden Age” of pomology. Orchards were planted with this great diversity with dozens of cultivars typically found in any orchard. The diversity of fruit provided for a long ripening and harvest allowing a family farm to have a longer supply of fresh fruit and process more food for storage.

Following the Civil War and related industrialization, fewer families farmed. Remaining farms grew larger. By the 1880s, orchards in the East became large commercial enterprises. The genetically diverse orchards with many varieties gave way to bigger orchards with only a few types of cultivars. Theses trends came west, but only gradually. Genetically diverse orchards were still being planted in Colorado into the 1900s.

Colorado Orchard History Pre-1920

It is during this period that the first attempts at homestead orchards in the 1840s, and commercial orchards in the 1860s, are documented. Despite the fact that Native Americans had harvested native fruit in Colorado for generations - including the American plum - people in the 1870s still believed that it was “crazy to think of growing fruit in Colorado.”[139] By 1880 growers were confident in their ability to grow quality fruit in Colorado, but realized there was much still to learn.

The varietal experimentation that was occurring across Colorado’s fruit growing regions was amplified by the need to find trees that would grow and produce in the complex setting of high altitude plains and canyons, and the perennial drought that existed beyond the 100th

[139] Colorado State Board of Horticulture, 1901, p. 109

meridian. Growers met to discuss their challenges and horticultural organizations were formed to advance the economy of fruit.

In Colorado this Golden Age of fruit began in the 1860s and continued until the early 1900s. Many of the new varieties of the day found a home in Colorado orchards including Winter Banana, Senator, and the enormous Wolf River. Growers were discovering and promoting new varieties including Colorado Sunset, Mountain Sweet, and the Colorado Orange apple.[140] Charles Pennock hybridized plums by Fort Collins, Jasper Hall would name a now lost peach seedling Ute Peak after the mountain that rises above the Four Corners.[141]

As lands on the Western Slope were "opened" to white settlement in the late 1800s experimentation continued. Peaches, considered nearly impossible to grow along the Front Range, would find their sweet spot in the western canyons and mesas. Sweet cherries would thrive in Paonia, pears in Escalante canyon.

By the turn of the 20th century, growers would realize that Americans preferred "a box car load" of red apples. Organized Extension Services and State Agriculture Colleges would promote uniformed growing practices, and encourage growers to reduce the number of cultivars in their orchards. Combined with the ability of the Delicious apples to produce high quality fruit at this altitude when blossoms did not freeze, new plantings of genetically diverse apples ended by 1920.

Time Period: 1881-1945 National / 1921-1945 Colorado

National Orchard History 1881- 1945

American orchards during this time became larger commercial enterprises utilizing greater labor and transportation resources to harvest and ship fruit to growing cities. Government agencies, research stations and agricultural colleges became the source for information designed to increase productivity and professionalize fruit growers and their industry.

Though orchards increased in size and decreased in diversity, the shape and geometry of the orchard resembled earlier plantings; large trees on seedling rootstock, planted in a 25' x 25' grid. As the Red Delicious and Golden Delicious apples gained popularity most other varieties disappeared until there were about ten commercial apple varieties being grown. Other

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[140] Steinel, 1926, p. 504

[141] Colorado State Board of Horticulture, 1899, p. 42

orchard fruits continued to be grown in favored regions with both the size of orchards growing, and the varieties of peaches, plums, and pears decreasing.[142]

Colorado Orchard History 1921 - 1945

During this time period, orchards in Colorado followed national trends with fewer varieties grown over more acres. Homestead orchards of a few acres became less common as large growers monopolized and displaced the market. Trees were still grown on seedling rootstock and orchards were still planted on widely spaced grids of 25x25 feet or greater. The big difference between these orchards and the older orchards was the reduction in the number of varieties grown thereby limiting their genetic content.

In Montezuma County, George Halls' "Beloved Orchard" of the 1890s contained more than twenty five varieties of fruit on several acres. In contrast, the Burrell orchards west of Cortez, planted between 1939-1941, contained Delicious, Jonathan, Rome, Golden Delicious and a few "improved" Winesap apples planted over 240 acres.

During this period commercial orchard districts became more specialized as to the types of fruit that were grown - peaches in Mesa County, apples in Delta and Fremont counties, tart cherries in Larimer County.

Time Period: 1946-present - National and Colorado History

National Orchard History 1946-present

Orchards underwent radical transformation following WWII. With apples, the size of the tree decreased as the utilization of dwarfing rootstocks increased. Red Delicious remained the dominant apple variety, but now many of its redder sports dominated a market characterized by large amounts of not well flavored apples. In the 1980s consumers began to reject the Red Delicious apple as they were introduced to Fuji, Gala, and Granny Smith. The over planting of the no longer marketable Delicious led to a crash of the American apple industry. Trees were ripped out, consolidation occurred, orchards got bigger.

High density styles of plantings increased the number of trees per acre from 70 to over 2,000 trees. The new style orchards are expected to be pulled out and replanted every ten to fifteen

[142] Dolan, 2009, p. 111

years with whatever variety looks to be the new best seller. Costly inputs of infrastructure and labor caused many large orchards to become parts of larger corporations.[143]

After years of trials and development, Washington State released the Cosmic Crisp apple in 2019. The Cosmic Crisp has been planted widely in Washington at an unprecedented level with a 20,000,000 bushel capacity of these apples expected in a few years. The long development process that led to the introduction of the Cosmic Crisp makes it doubtful that these trees will be torn out in a decade and replaced with a hot new variety. In this the Cosmic Crisp is bucking current orchard trends, but the success of this gamble remains to be seen.

Dwarf rootstocks played a more minor role in other orchard fruits but growers realized that peaches, cherries, and plums could all be grown in tight spacing in hedgerows. Like apples, fewer varieties of other fruits were also grown. Occasionally new varieties of fruit crosses, like Pluots, plum x apricot hybrids, were developed.

Colorado Orchard History 1946-present:

Growers in Mesa and Delta counties upgraded their operations to the latest industry standards, including high density, dwarfing plantings. This process happened gradually first with the emergence of semi-dwarfing spur varieties and concurrently by experimentation with clonal dwarfing rootstocks.

After the popularity of the Delicious declined, Colorado growers switched to Gala and Fuji apples, though the packing houses did not like having to learn how to put a different shaped apple into a box. Growers that could not or did not switch to new varieties and new styles of planting got out of the business, either by selling their orchards to larger growers, or by pulling the trees out. Marginal, and even prime orchard ground, in the Grand Valley was claimed by development.[144]

Remaining growers benefited from the access to markets developed by construction of the I-70 corridor, enabling the Western District to remain a profitable fruit region worth the expense of new production regimes. Palisade, it must be noted, is still considered one of the best peach growing areas on earth.

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[143] Dolan, 2009, p144-146

[144] MORP conversations with Western District fruit growers Steve Ela and Dan Williams, 2020

Spurred by the work of Montezuma Orchard Restoration Project, a new interest has arisen in Colorado to document and preserve the thousands of old fruit trees that remain from these historic orchards. Some times the trees are a part of large standing orchards in rural landscapes, other times they are a single tree binding suburbia to a forgotten past.

New opportunities at farmers markets, and through community supported agriculture are creating a chance for people in Colorado to re-taste the legendary quality of Colorado fruit. Though we beam with well deserved pride at the quality of our Colorado peaches we forget that Colorado was renowned for growing exceptional apple crops, full of color and flavor.

Apple production in Colorado is at a crossroads. Will the interest in local produce and Colorado cider help to rebuild the apple economy? Or, will apples slip to the level of statistical insignificance, like plum, cherry, and pear production have become in the state?

Growers today know what our early growers learned, though beset with challenges, Colorado grows some of the finest orchard fruit ever seen or tasted on earth. Looking at the trend of declining growth in apple production in Colorado it would be easy to believe that the apple industry in the state is doomed.

In conversation with multigenerational grower Dan Williams, he related that in spite of the numerous challenges to growing and marketing fruit, specifically apples, he still believes that his grandchildren will be able to carry on the orchard business started by his grandparents over a hundred years ago. Premium quality creates opportunities. The history and story of Colorado apples helps to market its fruit.

Figure 52: Spring in the Williams Orchards, Cedaredge. Shows modern, high density trellis system and wind machine in the distance. (Snowcapped Cider, 2020)

INFORMATION FOR REGISTERING HISTORIC ORCHARDS IN THE NATIONAL REGISTER OF HISTORIC PLACES

This chapter is meant to provide guidance for using National Register criteria for the evaluation of significance and integrity of historic orchards. For a more in-depth understanding of National Register criteria see *National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation*. For a more detailed discussion about orchard listing and the National Register see Dolan 2009, *Fruitful Legacy*.

Historic orchards in Colorado, whether a single tree or a group of trees, may be eligible for listing in the National Register of Historic Places. Orchards may be listed individually or as a contributing feature, and may be part of a historic district or an individual historic site.

A fruit tree is any tree that bears edible fruit. An orchard is a horticultural system consisting of a plantation of trees consisting of one or more varieties, and one or more species of fruit. Older individual fruit trees may be remnants from a larger orchard or they may have been planted in the landscape as individual trees without the organized horticultural system that defines an orchard. Scattered or individual trees that lack the integrity of an organized horticultural system should be identified as remnants or individual plantings and not considered an orchard.

Plantings may be simple or complex. Simple orchards are composed of fewer features. Home use, "homestead" orchards would often contain many types of fruit including apples, apricots, cherries plums, pears - and depending on growing region - peaches and sweet cherries. What makes these orchards simple is the lack of commercial infrastructure such as packing sheds, although they often had root cellars. The other main defining feature of homestead orchards is their size. Most homestead orchards had fewer than fifty trees, and often fewer than twenty trees. Small commercial orchards of between one to five or more acres often were also simple orchards taking advantage of local markets with little infrastructure for packing and storing apples.

The Hutchinson orchard, part of a state historic site near Salida, is a fine example of a simple orchard. Planted in at least two different time periods, the older apple trees are pruned with branching beginning higher on a tall main trunk. The orchard contains a "newer" planting of likely Jonathan apple trees that are pruned in a low-head, open-bowl style, and consist of closer tree spacing. Though the orchard kept up with trends that were prevalent during the different periods of planting, it remains a simple orchard.

Complexed orchards contain interrelated systems necessary for the development and benefit of the orchard. Examples include, irrigation ditches, defined boundaries such as fence and windbreaks, and circulation systems that show how people and equipment moved through the orchards. These systems can change overtime as new technologies are adapted. Structures, including large root cellars, packing sheds, docks, and refrigerated storage are often associated features of complexed orchards.

As a cultural resource, orchards are a combination of tangible (touchable or real) and intangible features (not having a physical presence). For individual historic site eligibility, an orchard must have both significance and integrity. An orchard property could be significant at the local, state, or national level. Determination requires an understanding of the history and condition of the resource in relation to its associated historical context.

For listing on the National Register, an orchard must be shown to be significant for one or more of the National Register Criteria for Evaluation.

A. Associated with events that have made a significant contribution to the broad patterns of our history.

B. Associated with the lives of persons significant in our past.

C. Embodying the distinctive characteristics of a type, period, method of construction, or that represents the work of a master, or that possesses high artistic values, or that represents a significant and distinguishable entity whose components may lack individual distinction.

D. Having yielded, or may be likely to yield information important in prehistory or history.

Applying the National Register Criteria to Orchards and Fruit trees

Three of the four criteria above, A, B, and C, have two or more applications for orchards and fruit trees. In addition, orchards must retain integrity and be associated with a significant historic context.

Applying National Register Criterion A to Orchards and Fruit Trees

Criterion	Type of Significance
A.	Associated with events that have made a significant contribution to the broad patterns of our history
Category A[1]	The orchard or fruit trees have played an important role in prehistory, in the settlement history, or in the subsequent history of development of an area
Category A[2]	The orchard or fruit trees are associated with a historic horticultural innovation, practice or event
Category A[3]	The orchard or fruit trees are associated with a historic event not related to horticulture

Table 1: Criterion A (Dolan 2009, p. 154)

Category A1: The orchard or fruit trees have played an important role in prehistory, in the settlement history, or in the subsequent history of development of an area. The suitability for fruit production greatly influenced the settlement of Colorado. Places once viewed as inhospitable to crops became fruit growing centers and attracted settlers. The orchards around Florence, CO played an important role in the settlement of Fremont County. As with ranching and mining, the fruit industry was a foundational component of the economy with commercial orchards planted by some of the earliest settlers, notably Jesse Frazer. Orchards in Mesa and Delta counties played an important role in the continuing development of those locations once it was proved that fruit would grow there. Originally considered a barren wasteland "best left to the Utes", growers like Union Colony founding member and founder of the town of Fruita, William Pabor, saw the potential for orchards on the Western Slope, and spoke of the perceived "need" to remove the Utes from Colorado in order to expand settlement and plant orchards. The fruit crop provided jobs for settlers, not only for the growers, but for the pickers, fruit packers, and all of the associated employment of transportation and service infrastructure. Although nearly every orchard planted pre-1920 in Colorado meets the criteria for category A1, it does not mean they all retain sufficient integrity for National Register inclusion, each site must be individually evaluated.

Category A2: The orchard or fruit trees are associated with a historical innovation, practice or event. Both low-head, open-bowl orchards, and orchards that were top-worked

from many to few varieties are examples of historical innovations and practices. The Hover orchard in Montezuma County has examples of low-head, open-bowl pruning, notably nearly twenty, century-old, Winter Banana apple trees. The same orchard also has several examples of trees that were top-worked from one variety into another, including a rare Thunderbolt apple that was top-worked into a common Jonathan apple, though some of the Thunderbolt branches remain.

Category A3: The orchard or fruit trees are associated with a historic event not related to horticulture. The peach orchard at Gettysburg National Battlefield is a prime example of the horticultural aspects of the orchard having nothing to do with the events that transpired. This is an area for further research in Colorado. The best potential example in Colorado that we are aware of is the historic orchard planted at Old Fort Lewis at Hesperus that shares the same campus that was site to a military outpost later turned into Indian boarding school. We believe the orchard was planted in 1923 a few years following the closing of the boarding school when the campus became a public high school. However, records are slim, and the site deserves further investigation.

Figure 53: Historic orchard at Old Fort Lewis, Hesperus. Planted circa 1923. (Montezuma Orchard Restoration Project, 2016)

Applying National Register Criterion B to Orchards and Fruit Trees

Criterion	Type of Significance
B.	Associated with the lives of persons significant in our past
Category B[1]	Orchards and fruit trees are associated with a person or persons who played an important role in horticultural history, or in the horticultural development of the area
Category B[2]	Orchards and fruit trees are associated with a historically significant person not directly related to horticulture, such as a political figure, writer or artist

Table 2: Criterion B (Dolan 2009, p. 160)

Category B1: Orchards and fruit trees are associated with a person or persons who played an important role in horticultural history, or in the horticultural development of the area. There are orchards and fruit trees across the state that are directly associated with Colorado's early settlers that played an important role in horticultural history. Both Jesse Frazer and Dall Deweese of Fremont County played significant roles in the origination and distribution of the Colorado Orange apple[145] which became the only apple of Colorado origin to be renowned historically outside its borders. Its popularity remained through to at least the '30s until it became functionally extinct like so many others. In 2017, Montezuma Orchard Restoration Project located a tree in Cañon City believed to be a Colorado Orange[146]. The tree, and orchard in which it was found, are historically significant for many reasons including meeting Category B1.

The early fruit grower, and founder of Montezuma Valley Nursery, Jasper Hall played a significant role in the establishment of orchards in the Montezuma Valley, including the introduction of varieties into the state that are now considered historically significant for their rarity. For example, Jasper Hall is credited with bringing the now endangered Thunderbolt apple into Colorado. He was a foundational person in the founding of Montezuma County orchards as documented in area newspapers and Colorado State Board of Horticulture reports.

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[145] Deweese, 1914, p. 2

[146] See additional information "The Elusive Colorado Orange Apple"

Several orchards in Montezuma County, including the Hall/Olson orchard have surviving trees that were planted by Jasper Hall and with further research may meet Criterion B1 due to their tie to this early Montezuma County horticulturalist.

Figure 54: Colorado Orange apple tree at historic Highland Orchard, planted circa 1890-1900, Cañon City. (Montezuma Orchard Restoration Project, 2017)

Category B2: orchards and fruit trees are associated with a historically significant person not directly related to horticulture, such as a political figure, writer, or artist. This like the previous category is an area ripe for further research comparing notable residents of early Colorado that were not involved in horticulture with fruit trees or orchards from where they lived. For example, at the historic Jarvis house in Durango there is a large, old apple tree growing near the house. The DNA results were "unique unknown", meaning that it could be a seedling or the tree could be a forgotten variety, presumed extinct. The Jarvis Family was prominent in the Durango area for other business, but not orchards. The age and rarity of the tree combined with a prominent property makes the tree worth documenting and preserving. It should be noted, orchards or fruit trees associated with a historically significant person, not directly related to horticulture, may have less integrity to convey the historic context than orchards or fruit trees significant for horticulture in Category B1.

Figure 55: A century old apple tree towers above a two story Victorian house, of about equal age, Durango. (Montezuma Orchard Restoration Project, 2015)

Applying National Register Criterion C to Orchards and Fruit Trees	
Criterion	**Type of Significance**
C.	Embodying the distinctive characteristics of a type, period, method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction
Category C^1	Orchards or fruit trees that embody the distinctive characteristics of a type, period, horticultural system or style, or contain a rare or unusual genotype, such as a variety or strain of a variety, or feature continuity of traditional use and occupancy
Category C^2	Orchards or fruit trees that were part of a historic designed landscape; the orchard was designed for research, or for the demonstration of "good" horticulture

Table 3: Criterion C (Dolan 2009, p. 164)

Category C1: Orchards or fruit trees that embody the distinctive characteristics of a type, period, horticultural system or style, or contain rare or unusual genotype (a unique genetic signature), such as a variety or strain of a variety (a variation within a species), or feature continuity of traditional use and occupancy. Beginning with the earliest efforts of orchard planting in Colorado in the late 1800s, and continuing through our present time, distinctive characteristics of the orchards and fruit trees in Colorado have changed over time. These changes reflect national trends, from the geometry of the orchard and the size of the fruit trees, to even the the varieties grown here in the state. Historic orchards and remnant trees still found growing in Colorado represent the three periods of Colorado orchards described in this work.

Orchards from the early periods, pre-1920 and 1920-1946, still contain significant, observable information including fruit types, tree spacing, layout design, and pruning styles. Associated irrigation systems, sorting, storage, and shipping facilities may also be present to help reflect

the general feel of the orchard and its relevance as a commercial enterprise. The distinct periods of fruit production can be distinguished by observing and documenting age of associated buildings and structures, pruning styles, tree spacing and orchard designs, and the varieties, or lack of varieties, of fruit in the orchard.

Figure 56: While the DNA results of this tree are "unique unknown", we are fortunate to know it is a discovery of an historic (lost) cultivar vs seedling due to the evidence of a visible graft line. It is also in orchard row and has signs of being historically pruned. (Montezuma Orchard Restoration Project, 2017)

It is important to learn to distinguish a grafted tree from a seedling. Many seedlings grow along the ditches and fence lines of historic orchards. Historically in Colorado, during the first two orchard periods it was not uncommon for growers to bury the graft below soil line. Sometimes the trampling down of livestock will reveal the graft, otherwise, other clues of a grafted vs seedling tree are its location in orchard row vs fence line and/or having evidence of having been pruned at some point early in its life.

For an orchard, tree, or group of fruit trees to be individually eligible for the National Register, they must retain sufficient integrity, or horticultural characteristics, that convey the significance of the historic context. In other words, is the orchard, tree, or trees able to tell the story of its horticultural design? The orchard must also be associated with a significant historic context including rare cultivars or innovative usage of new growing systems, varieties, or rootstocks.

The historic Wayt orchard, planted early 1900, reflects the diversity of cultivars planted at the time before the standardization and industrialization of orchards. Several cultivars are either unique unknown or unknown, but matching other unknown samples from other orchards. The orchard also reflects developing trends. In addition to Ben Davis and Grime's Golden apples, there are Rome, Jonathan, and the back then relatively new Delicious variety. Several trees were top-worked to these varieties that were becoming preferred at the time. Through its now rare and endangered rare genotypes, and embrace of the apple varieties that would define the following period in fruit cultivation, the Wayt orchard conveys a sense of integrity for demonstrating evolving horticultural systems.

Figure 57: A Beloved Jonathan tree in the Historic Wayt Orchard, Dolores. Planted early 1900s. (Montezuma Orchard Restoration Project, 2014)

The Rome, Jonathan, and Delicious orchard at the historic Runck/Roundtree property conveys a sense of time and place through the few varieties of apples that are widely spaced over many acres. These full-sized, 20-30 foot tall apple trees planted on seedling rootstock are pruned in the low-head open-bowl style still prevalent at the time. They create the large, park-like orchards that defined the first two orchard periods in Colorado's history. This section of the Runk orchard is a fine example of the 1920-1946 era.

Figure 58: Historic Runck/Roundtree orchard planted circa 1940s. Notice the low-headed, open-bowl pruning style and wide, park-like spacing. (Ruth Lambert, 2018)

On the Hall/Olson site there grows a "newer" orchard, planted on semi-dwarfing rootstock during the 1950s. The orchard has alternating rows in blocks of four - four rows of Delicious apple trees followed by four rows of Rome Beauty apple trees, with the pattern repeating throughout the orchard. The orchard contains enough integrity to convey that the trees, short to the ground and closely spaced, reflect the trend toward dwarfing rootstocks.

Figure 59: Hall/Olson orchard planted in the 50s shows transition to dwarfing rootstocks and upright pruning style. (Ruth Lambert, 2019)

Category C2: Orchards or fruit trees that were part of a historic designed landscape; the orchard was designed for research, or for the demonstration of "good" horticulture. Today, research orchards are planted with the expectation that the trees will be pulled after 10-15 years and replanted with newer varieties. Over history, research stations have risen and fallen dependent upon funding levels. The prominent Austin Research Station, in Delta County was closed and sold off years ago. It is now a subdivision with no remaining fruit trees, although an adjacent property still has a historic orchard. At the Austin site and others across the country, varieties grown and even developed have been lost to extinction once closed. Rogers Mesa Station, also in Delta County, is currently reopened after having been shuttered for several years due to a lack of funds. Fruit trees had been removed from this trial site, but are currently being replanted with heritage and cider varieties in collaboration with Montezuma Orchard Restoration Project.

Figure 60: Heritage orchard trial at Western Colorado Research Center at Rogers Mesa. Pictured is a high density trellis system with trees planted several feet apart on semi-dwarf (M7) rootstock. (Montezuma Orchard Restoration Project, 2019)

A notable exception to the short lived nature of research orchard plantings is the orchard at Old Fort Lewis at Hesperus where a century-old orchard still stands. It is believed to have been planted in 1923 when the campus was a public high school. Later, the campus would become a two year college until it was moved to Durango in the '50s. From then on the old campus became known as the San Juan Basin Research Center, specializing in high-altitude agronomy and horticulture research. Though documentation of the early history of the orchard, including who planted it and why, has yet to be discovered, the orchard itself reveals a great deal of information. It is planted on terraces with the trees situated in berms demonstrating permaculture in concept years before the practice had been adopted by non-native agriculturalists. Though the orchard was planted around 1923 when trends had turned towards monoculture, there is not a single Rome, Jonathan, or Delicious in it. Rather, DNA analysis reveals a diversity of rare, endangered, and unknown apples surviving on site. Many represent varieties especially known for their cold hardiness including Wealthy, Hibernal, Tetofsky, Snow/Fameuse, and various crabapples.

Applying National Register Criterion D to Orchards and Fruit Trees

Criterion	Type of Significance
D.	Having yielded or may be likely to yield, information important in prehistory or history

Table 4: Criterion D (Dolan 2009, p. 176)

Criteria D: Having yielded or may be likely to yield information important in prehistory or history. Fruit trees, individually or as part of an orchard, including stumps and/or graft lines, can provide important information about the age of an orchard, how the orchard was planted, and occasionally, where the trees came from. Fruit trees, orchards, and associated structures have the potential to yield information about the people that planted and tended the trees and their lifeways. The orchards and fruit trees provide a snapshot of information from that specific site at its period of relevance. This could include varieties of fruit or techniques that were learned back east. Knowledge of the varieties, their uses and their origin can suggest further research as to traditions related to food and farming. These traditions could include vinegar and cider making, saucing, canning, drying, sorting and storing the fruit. Historic fruit trees and orchards also enable comparison with other similar orchards that were planted by people of different backgrounds from different regions of the country. How

the knowledge that these early growers brought with them, from Maine to Tennessee, was translated and adapted in Colorado, is a fascinating point of research.

Advances in genetic analysis of apples are helping to show that many trees remnant in Colorado's historic orchards meet Criterion D. Although many of these historic cultivars are now cases of missing identities - where their historic name may or may never be known again - genetic analysis can now often tell us the ancestry of these "lost" apples, providing clues from whence they came and how they spread across the landscape.

Defining the Period of Significance

When evaluating an orchard, tree, or fruit trees for eligibility to the National Register, a majority of trees that remain should be from the period of significance. Once eligibility is determined, then in-kind replacement of historic trees can occur in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties, and still maintain significance and integrity. The period of significance should reflect the beginning of when the resource dates and the period it still represents. Also, these resources can represent multiple periods of significance, if they reflect more than one period or more than one historical association.

The Winter Banana and Transcendent Crabapple that grow at the Hall/Olson orchard are Jasper Hall original trees, per interviews with the late Bill Olson, who's family bought the property in 1920 five years after Hall's death. Those two apple trees are historically relevant to Colorado's first orchard period, and to a person, Jasper Hall. The Hall/Olson property also contains an example of the movement towards dwarfing rootstocks in the Delicious and Rome orchard, planted in the 1950s, during Colorado's third orchard period. The Hall/Olson resource represents two periods of significance.

Defining Integrity

The historic integrity of an orchard, group of fruit trees, or single tree is a measure of physical authenticity conveyed by extant characteristics or features that were present during the period of significance. The National Register defines integrity relative to seven elements: location, design, setting, materials, workmanship, feeling, and association. The aspects of integrity are conveyed in cultural landscapes by the presence of relevant landscape characteristics and features as described by Dolan.

The Seven Aspects of Integrity Applied to Orchards and Fruit Trees

Quality	Description
Location	This is the place where the orchard or fruit trees were sown or planted, and their distribution upon the land.
Design	This is the combination of elements that create the form, plan, space, structure and style of an orchard or fruit trees in a horticultural system.
Setting	This is the physical environment of the orchard or fruit trees, including the land forms, rivers or streams, naturally-occurring vegetation, climate, elevation and aspect.
Materials	These are the physical elements that were combined or deposited in a particular pattern or configuration to form the orchard or fruit trees, including the seedling or grafted plant materials, ground cover plant materials, stakes, fences, windbreak and ditch materials.
Workmanship	This is the physical evidence of the crafts of a particular culture of people during the period of significance, such as cultivation and care of an orchard (propagation, planting, pruning, fertilizing, irrigating and harvesting) and protection of an orchard (pest control, animal husbandry, staking, fencing, and windbreaks).
Feeling	This is the orchard or fruit trees' expression of the aesthetic or historic sense of the period of significance, evoked by sounds, smells, and the seasonal rhythm of horticultural activities, productivity and change.
Association	This is the direct link or clear relationship between the important historic event, person or distinctive characteristics of a period, and an orchard or fruit trees.

Table 5: 7 Aspects of Integrity (Dolan 2009, p. 179)

Natural systems and features are of prime importance to orchards in Colorado because of our state's countless micro-climates and the effect of these micro-climates on an individual fruit variety's ability to thrive in a specific location. These factors can include a prevalent wind that moves cold air away from orchards, as in Palisade, or a high altitude location that keeps the fruit trees dormant longer into the unpredictable spring weather, like the orchard at Old Fort Lewis located at over 8,000 feet above sea level. The altitude of the orchard, and the local geographical features, from mesa tops to canyon bottoms, all factor into the vibrancy of the orchards and their eventual success. Though mostly clones, each fruit tree is still its own unique life form, a living thing that will do better in favorable conditions, not too hot and not too cold, with slow, deep, and properly timed waterings. Understanding the geology, hydrology - especially recognizing if an orchard is taping into ground water or seepage - and altitude related climate conditions is essential for understanding the orchard as a part of the landscape.

Figure 61: The historic Welty orchard in the Mancos Valley benefits from being situated on a slope that moves cold air away from the orchard. Landscapes like this were choice orchard sites of Colorado's early fruit growers. Planted early 1900. (Montezuma Orchard Restoration Project, 2017)

Colorado's extraordinary natural landscape features means that most other landscape characteristics will be influenced by the impacts of canyons, mesas, valleys, and water. The orchard shape, spacial organization, the location of buildings, the contour of irrigation ditches, even tree types and and orchard spacing are often determined by the natural features and topography of the orchard location. Because many orchards are planted on higher ground, views and vistas are often spectacular, and should be documented. Many small features including fruit boxes, harvesting ladders, horse drawn implements, and early tractors and associated equipment are common to find at orchard locations. These objects can provide context for innovations and customs on the farm, perhaps in the form of a company stamp of the year and location of manufacture on a historic piece of equipment, to stacks of wooden apple boxes, occasionally with local or regional historic fruit labels on the boxes. It is also important to remember that many orchard locations, especially in southwest Colorado, were farmed a thousand years ago by ancestral Puebloans, and artifacts from their existence may still remain on these sites.

Figure 62: Old farm equipment and sweeping views, including of the Ute Mountain, are landscape characteristics that contribute to the historic integrity of the Burrell/Pitts orchard, Montezuma County. Planted circa 1940. (Montezuma Orchard Restoration Project, 2015)

The extent that these orchards and fruit trees can tell their story, in context, depends upon the seven elements of integrity as defined by the National Register. Integrity is a measure of the physical authenticity of the orchard, fruit tree, or fruit trees at the time of their evaluation for the National Register. As Dolan states, "*A property significant under Criterion C must retain those physical features or landscape characteristics that characterize the type, period, or method of construction the property represents*."[147] For an orchard, a fruit tree, or fruit trees to have integrity they must clearly demonstrate the genetics, pruning style, planting style, or other features that represent the period of significance for which the orchard, tree, or trees are associated. This integrity must be present at the time of National Register evaluation.

Even if orchards, groups of fruit trees, or individual fruit trees lack the integrity to place them on the National Register under Criterion C, they can and should be documented as contributing features for the potential listing. Orchards have often been overlooked in the documentation and preservation of historic sites despite their importance as a cultural landscape, and their critical relationship with the people that lived or worked there. Historic sites that included an orchard during the site's period of relevance could and should be replanted with historic cultivars that are grafted onto appropriate rootstocks.

Integrity is a measure of the physical authenticity of the orchard or fruit tree as a cultural landscape. It is important to note that an orchard or fruit tree(s) do not necessarily have to be a cultural landscape in their own right - some may possess these characteristics and some may not. Orchards that have those characteristics present can be identified as cultural landscapes and listed in the National Register as historic districts or historic sites (depending on complexity and size). Whereas, orchards that lack those landscape characteristics are not considered cultural landscapes, but can be listed in the National Register as historic sites or as contributing features to larger cultural landscapes that are listed as historic districts or sites.

<u>Evaluating the Integrity of Individually Significant verses Contributing Orchards and Fruit Trees</u>

Orchards or individual fruit trees are most frequently listed in the National Register as features that contribute to the significance and integrity of larger historic districts or historic sites. The tree, trees, or remnant orchards lack the integrity necessary to convey a coherent, historic representation in a way that clearly represents its period of significance. A single, old tree on a historic site contributes to the overall integrity of the site, but often lacks integrity as its own resource. Though not fully intact the single tree or remnant plantings may convey

[147] Dolan 2009, p.182

the period of significance and are important to the integrity of a site or district as contributing features.

Landscape Characteristics Applied to Orchards	
Landscape Characteristic	**Description**
Natural Systems and Features	These are the natural aspects that influenced the development and resultant form of the orchard, such as climate, geology, geomorphology, hydrology and physiology.
Spatial Organization	This is the arrangement of elements creating the ground, vertical and overhead planes that define and create spaces in the orchard.
Land Use	This is the organization, form, and shape of the orchard in response to land use.
Cultural Traditions	These are the practices that influenced land use, patterns of division, building forms and the use of materials in the orchard.
Circulation	This is the spaces, systems and materials that constitute the systems for movement in the orchard.
Topography	This is the three-dimensional configuration of the orchard ground surface related to land use, and characterized by features and orientation.
Vegetation	This is the fruit trees, ground covers, windbreaks, pasture vegetation, and other woody and herbaceous plant materials, both indigenous and introduced.
Buildings and Structures	These are the three-dimensional constructs of the orchard, such as farmhouses, fruit storage barns, fruit cellars, pickers' cabins, packing sheds, and garages.
Cluster Arrangement	This is the pattern of nodes of clustered features in the orchard, such as buildings and structures, and rows or blocks of fruit species or varieties.
Small Scale Features	This is the small elements that provide detail and diversity combined with function and aesthetics, such as a windmill, fruit barrels or boxes, tree ladders, tree stakes, fences, and equipment or machinery for planting, mowing, tilling, pruning, spraying, fertilizing, fruit harvesting, packing or fruit storage.
Constructed Water Features	These are the built features and elements that utilize water for aesthetic or utilitarian functions in the orchard, such as a diversion dam, diversion channel, irrigation ditches, head gates, check dams, irrigation pipes, sprinklers, water storage tanks, ponds, reservoirs, berms and water pumps.
Views and Vistas	These are the features that create or allow for a range of vision in the orchard, which can be natural or designed and controlled.
Archeological Sites	These are the sites in the orchard containing surface and subsurface remnants related to historic or prehistoric use.

Table 6: Landscape Characteristics Applied to Orchards (Dolan 2009, p. 180)

Integrity of Rare Examples

Where orchards or groups of fruit trees have been degraded or suffered alterations, comparisons with similar properties are needed to evaluate the remaining integrity of the site. These comparisons are particularly important to evaluate rare surviving examples of a property type. Although essential physical features to convey significance must remain, comparisons may justify the acceptance of greater alterations, deterioration or fewer features at rare sites provided the property is still considered significant.

Defining Boundaries

Defining boundaries is important in identifying a historic orchard site or district, and groups of fruit trees or individual fruit trees as historic sites. The boundaries should encompass the fullest extent of extant characteristics that existed during the period of significance. In Colorado, the original footprint of an orchard has often been broken up by subdividing the land overtime. The original boundary of the orchard many now consist of many property owners. Trees and orchard features may or may not remain on adjoining properties, but these properties should be included in defining the boundary. It is not uncommon for owners to not realize that their orchard or tree was part of a greater site. Old aerial photos, remnant stumps, historic archives, and interviews with knowledgeable people may contain clues. In urban settings the original footprint of an orchard may be an entire neighborhood where single remnant trees remain in backyards. Further investigation often reveals the remnant trees are clearly in orchard row and that the houses were built around the orchard. Also, reforested land should be included within the boundary if fruit trees still remain in an area that was formerly cleared for cultivation. Areas with high water tables often have seedlings of historic fruit trees growing in thickets among weedy Russian Olive and Siberian Elm trees, and should be documented as being in the historic orchard boundary.

Cultural Resource Management of Orchards and Fruit Trees

Colorado's oldest orchards are rapidly declining from age and stresses from development pressure, climate change, and drought. MORP believes time is of the essence and it is important not to delay in orchard survey and genetic preservation while one may be determining National Register status. Over and over again, we have people reach out to us wondering if an old tree is rare enough to be saved. It does not matter the variety, if you know it is significant for its age - graft it, preserve it, and re-establish it. You can always work to find out what it is later, even if the mother tree has then died. If you wait, there may be nothing left to conserve. Once an orchard or tree(s) have been listed on the National Register,

Secretary of Interior guidelines are available for the identification, preservation maintenance, stabilization, treatment, and germplasm conservation of the resource.[148]

Figure 63: 1937aerial photograph of the Hall/Olson site. Whereas the orchard was one property when this photo was taken, defining the original orchard boundary for purposes of historic preservation and documentation, now consists of four property owners. (United States Department of Agriculture)

[148] Dolan, pp 192-195

METHODOLOGY

Figure 64: Addie and Jude Schuenemeyer discuss the possible variety of a 100-year-old apple tree. (Nancy Lofholm, Colorado Public Radio, 2016)

As part of its research, Montezuma Orchard Restoration Project conducted archival searches of source material from the State Archives, Denver Public Library, Royal Gorge Museum, Montezuma County Historical Society archives, and numerous trips to the Colorado State University (CSU) archives. During one of the CSU research trips, MORP was able to confirm the existence of multiple boxes of specimens from the Mariam Palmer wax apple collection. After the accession of the collection into the CSU archives MORP was able to use a wax cast to help identify the lost Colorado Orange apple.

Scores of boxes of CSU Extension Service (AEXT) records were examined from the early to the late 1900s from every county that was considered to have a commercial orchard economy. With consistency, the areas with grower associations for - peaches in Mesa County, apples in Delta County, cherries in Larimer County - received the greatest support from extension agents as evidenced through their reports. In counties without grower associations, orchards competed for the Extension agent's attention with 4-H, home economics, and farm beautification projects.

MORP matched the archival work with field work including pinpoint mapping, photography, oral interviews and other historical documentation, specimen collection and comparison on over one hundred orchards across the state's historic orchard districts.

The archival and field research were compared to Dolan throughout the development of this context. The consistency of overlap between what Dolan documented in Fruitful Legacy and what MORP found in both field and archival research is remarkable as documented in this context, though innovations developed in the east took longer to adopt in Colorado. Our early orchards were initially filled with diversity, then, as in the national context, monocultural practices dominated from one world war to the next, followed by the movement to spur and dwarfing trees in dense orchards. Colorado paralleled national trends.

CONCLUSION AND RECOMMENDATIONS

Colorado's early fruit growers planted their orchards with tenacious optimism in an unproven land. Through trial and error they developed an industry that produced millions of dollars of quality fruit. MORP's survey and research shows there are thousands of old trees representing hundreds of rare and endangered varieties still growing, scattered around the state. Although much of the history is largely forgotten this context is one of many efforts to change that.

These remnants of early diversity remaining in Colorado's landscape have resisted pests, disease, and drought for over 100 years. We are provided a timely opportunity to identify, propagate, and release these adapted varieties to growers and the public at a time when they are at risk of extinction and consumers are demanding Colorado apples with unique genetic heritage, appearance, taste, and story of origin.[149] MORP has received hundreds of requests from orchard owners, cider makers, nursery growers, consumers, and backyard gardeners for the Colorado Orange apple alone. A frequent follow up question is, "What else do you have that is rare?"

Now that MORP has captured many of these rare and endangered genetics, the challenge remains that that many varieties are individually confined to one last tree. As heritage fruits continue to gain interest through MORP's program work and national trends, old Colorado apples have an urgent and rare opportunity to be renowned again. MORP has made progress documenting Colorado's historic orchards, yet there remains an urgency to build upon this work before more of Colorado's historic apple varieties are lost.

Indeed, these rare and historical trees can be saved through clonal propagation, becoming the foundation for replanting Colorado orchards. There is economic gain to be had through the living and historical preservation of these genetics. During a question and answer session after a presentation in Denver one of the first questions asked was, "Where can Colorado apples be found"?

The history of orchards in Colorado is a story of people, place, and plants, how they grew together, and how they often fell apart. Though there is deep historical record in newspapers, state reports, and in the living trees themselves, this is a subject that has received little scholarly research. If we are to keep from losing the history and the economic opportunities that are unique to this cultural resource more effort should be made to record and interpret

[149] See Montezuma Valley Apple Market Study https://montezumaorchard.org/wp-content/uploads/2018/06/Finalrev-Updated-MORP-Market-Study-January-2018.pdf

our orchard history. MORP's survey work to locate and record historic orchards and trees is extensive, yet represents a small fraction of what is still present. More trees die every year, time is of the essence. We are currently in conversations with CU Boulder to explore combining efforts with MORP and the Boulder Apple Tree Project (BATP) to complete an extensive historic orchard survey of the entire state. Such an effort will require significant coordination and funding. Additionally, in 2021 MORP and BATP joined forces with fruit preservationists from across the country to develop the mapping application RegisTREE of North America,[150] to preserve our fruit and orchard heritage on a national level through documentation, conservation, and collaboration. Members of the public are encouraged to participate.

Colorado's State Historic Monuments, State Parks, opens spaces, and other public locations are known sites of homesteads, ranches, estates, industry, and education. Many were also home to orchards and contain remnant trees that are often over or underlooked. Detailed attention should be payed to these important cultural landscape features, including documenting what was there and replanting historically accurate cultivars. MORP and other efforts in progress or identified as a need include, but are not limited to: Cross Orchards Historic Site, Grand Junction; Gold Medal Orchard (public/private partnership), McElmo Canyon; Old Fort Heritage Orchard, Hesperus; Rock Ledge Ranch, Colorado Springs; Western Museum of Mining and Industry, Colorado Springs; Hutchinson Homestead, Salida; Castlewood Canyon State Park; Reynolds Ranch, Longmont; Mancos State Park; 1883 Water Works, Fort Collins; Penrose House, location of El Pomar Foundation; Holy Cross Abbey, Canon City; and Ken-Caryl Ranch, Littleton.

This context would benefit from additional research that takes a deeper look at each historic fruit district, detailing more of the people including minority voices, varieties, and locations where orchards existed across Colorado. Though there is consistency between Dolan's national context and the research that MORP used to create this document, there is more information about this history that should be included in a published work. There is now a great opportunity for students and researchers to expand on any part of this context and put it into action. For example, a biography of a person, detailed research on an orchard district, research paper on fruit grower associations, site survey of an historic site with remnant orchard, study or preservation of a variety, or restoration of a cultural landscape.

Charts on the keeping qualities of winter apples, graphs of codling moth studies, reports and photographs of pruning workshops, poems praising the high quality of Colorado grown fruit, direct experiences in grower's own words, and so much more. These historical accounts fill

[150] See additional information "RegisTREE of North America"

books and boxes. Most of this documentation has not been viewed for decades, except as part of this research, forgotten like the trees described in these works. And like the fruit on the trees, the history is full of color and flavor. This is a history hidden in plain sight, relevant and a guide to future growers, and as persistent and determined as the trees and people that remain.

GLOSSARY

Budding

Clonal propagation of a plant using a single bud from a parent plant from which to grow another genetically identical plant, either onto rootstock or branch of another tree. Performed in the summer, mostly on peaches, plums, cherries, and pears.

Cultivar

A plant variety that has been produced in cultivation by human intervention. The terms variety and cultivar are often used interchangeably among fruit growers.

Clone

A genetically identical offspring of the parent plant, creating a new plant from a cutting as in grafting.

Cultural Resource

A building, site, district, object, or structure that is historically significant.

Dwarfing Rootstock

Rootstocks that limit the size of the tree that they are grafted onto (see grafting). These are usually clonal rootstocks (see clone).

Dwarfing Tree:

A tree that grows smaller than standard height often because of the use of a dwarfing rootstock.

Grafting:

Clonal propagation (see clone) of plants by joining the cutting of one plant (see scion) onto the branch or rootstock of another plant. There are hundreds of styles and techniques of grafting.

Landscape Characteristics: Landscape characteristics are the processes and patterns on the land that are tangible evidence of the activities and habits of the people who occupied, developed, and shaped the land to serve human needs.

Rootstock

A tree grown for desire traits of its root system such as mature height, cold hardiness, or disease and drought tolerance that another variety or cultivar will be grafted onto. Most rootstock is a year old when it is grafted onto.

Scaffold

The branching structure of major limbs coming from the tree trunk.

Scion

A cutting (small piece of branch) from a desired variety that will be attached to a rootstock or another tree through grafting. The best scion comes from the previous year's clean, new growth, also known as water shoots.

Seedling

A tree grown from seed. With apples, each new seedling represents a unique variety.

Sport

A genetic variation on part of a tree, usually a limb, that displays different characteristics from the main tree such as redder fruit, earlier ripening, or heavier fruit set.

Spur-type variety:

A sport of a variety that has more fruit bearing spurs than its parent.

Standard tree

A tree on its own roots or on a seedling rootstock that allows the tree to reach its natural size, about fifteen feet for a peach, or twenty five feet for an apple.

Strain

A variation within a variety or cultivar.

Top Working

The process of grafting scions of another variety or cultivar on the main branches of a fruit tree usually to obtain what is at the time considered more desirable fruit.

Variety

A naturally occurring variation within a species. The terms variety and cultivar are often used interchangeably among fruit growers.

Whip

A one to two year old tree without branching.

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APPENDICES

LIST OF OLD COLORADO APPLES

Variety	Rarity	Current Source	Historical Source
Anis	endangered	listed w/ Botner listed in Geneva listed in Fruit/Nut	1891 list
Anisovka	lost/wanted		1891 list
Anisim	endangered	listed w/ Botner listed in Geneva listed in Fruit/Nut	1891 list
Aport, Alexander	common	listed in Fruit/Nut	1891 list 1922 survey Pennock List Pabor 1883

Table 7: Click here to access the full list of old Colorado apples. This is a work in progress as on-going research discovers further information. Updated results will be included at this link.

LIST OF HISTORIC GROWERS AND VARIETIES

Context ID	Variety ID	Grower ID	Premiums won	Years mentioned	Notes
Montezuma Jo	Grimes Golden, Grime	A. Brumbaugh	Best Plate, Second	1909	Montezuma
Montezuma Jo	Gano	A. Brumbaugh	Best Plate, First	1909	Montezuma
Montezuma Jo	Northern Spy	A. Brumbaugh	Best Plate, First	1909	Montezuma
Montezuma Jo	Oliver, Senator	A. Brumbaugh	Best Plate, First	1909	Montezuma
Montezuma Jo	Black Ben Davis	A. Forsell	Second	1906	Montezuma

Table 8: Click here to access the full list of historic growers and varieties. This is a work in progress as on-going research discovers further information. Updated results will be included at this link.

FURTHER INFORMATION

MONTEZUMA ORCHARD RESTORATION PROJECT

THE ELUSIVE COLORADO ORANGE APPLE

REGISTREE OF NORTH AMERICA

OLD COLORADO APPLES, CLASS VIDEO

COLORADO'S FRUIT GROWING HISTORY, CLASS VIDEO

GOLD MEDAL ORCHARD